JOURNAL

OF THE

Royal United Service Institution

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL.

Editor - Captain H. GARBETT, R.N. (Retired).

Vol. XLVI.—15th OCTOBER, 1902.—No. 296

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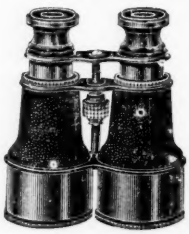

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1875. Commander GERARD H. U. NOEL, R.N.
1876. Lieutenant JOHN F. G. ROSS OF BLADENSBURG, *p.s.c.*, Coldstream Guards.
1877. No Medal Awarded.
1878. Captain EMILIUS CLAYTON, *p.s.c.*, Royal Artillery.
1879. Captain the Hon. EDMUND R. FREMANTLE, C.B., C.M.G., A.D.C., R.N.
1880. Captain J. K. TROTTER, *p.s.c.*, Royal Artillery.
1881. Captain LINDESAY BRINE, R.N.
1882. No Medal Awarded.
1883. Captain CHARLES JOHNSTONE, R.N.
1884. Captain G. F. BROWNE, *p.s.c.* Northamptonshire Regiment.
1885. Lieutenant FREDERICK C. D. STURDEE, R.N.
1886. Captain C. E. CALLWELL, *p.s.c.*, Royal Artillery.
1887. No Medal Awarded.
1888. Captain J. F. DANIELL, *p.s.c.*, R.M.L.I. (Military Medal).
1889. Captain HENRY F. CLEVELAND, R.N.
1890. Captain G. E. BENSON, *p.s.c.*, Royal Artillery.
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13th—D. D. Haskard 10,071		52nd—B. R. Cooper	9,041
27th—P. U. Johnson 9,518		53rd—G. J. P. St. Clair	9,023
28th—E. Cummings 9,500		70th—C. H. Ommanney	8,740

July, 1901.

20th—G. H. Donnelly 9,699		64th—R. F. Cottrell	8,275

SANDHURST, December, 1901.

CAVALRY.

10th—F. B. Hurndall 5,781		16th—L. C. B. Merriman...	5,133

INFANTRY.

93rd—G. R. H. B. Maitland-Addison... 6,491		— C. A. Tennyson*	5,596
— —J. Stirling* 5,893		— H. A. Ibbotson	5,573

July, 1901.

3rd Cavalry—V. C. P. Hodgson ... 7,539		104th Infantry—H. Hart...	5,807
45th Infantry—H. G. Bignell 6,723		120th ,, H. T. C. Jones-Vaughan	5,590
96th ,, M. J. Raikes 5,911		4th King's India Cadet J. S. Oldham ...	5,521
97th ,, J. G. P. Romanes ... 5,886			

INDIA FORESTS, July, 1901.

5th—Pelham Stewart Corbould 6,550

COOPER'S HILL, July, 1901.

— F. W. Abbatt... ... ... —

MILITIA MILITARY COMPETITIVE.

Special arrangements have been made to meet the requirements of Militia Officers preparing for the Competitive Examinations to be held under the new regulations, and the important subjects of MATHEMATICS and MILITARY HISTORY are under the personal supervision of MR. CARLISLE and CAPTAIN JAMES respectively.

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September, 1901.

Under the New Regulations.

INFANTRY.

10th—C. W. Watson 16,949		— *M. L. Slaughter	9,720
13th—H. C. Stephen 14,830		— *W. C. Hutcheson...	9,663
— *H. A. Hildebrand 9,750		— *G. H. M. Marsh	9,661

UNIVERSITY.

13th—A. E. Burnett 5,035		14th—R. C. G. Pollock	4,970

CAVALRY.

— E. R. Holloway 10,162

March, 1901.

Under the New Regulations.

CAVALRY.

1st—C. E. Pym 18,159		2nd—H. H. Webber	14,190

ROYAL ARTILLERY.

4th—K. E. Milford 17,357		6th—J. W. Povah	16,808

FOOT GUARDS.

4th—E. S. Ward 8,281

INFANTRY.

3rd—M. Fisher 18,676		10th—C. J. O'Sullivan	17,956
8th—T. E. Bennett... 18,103		22nd—L. A. Jones	16,733
9th—H. J. U. Wilkins 17,981		— *V. F. Jackson	15,401

UNIVERSITY CANDIDATES.

2nd—G. Thwaites 6,570		25th R. G. Raw	4,520
3th—A. F. Attwood 5,415		33rd—G. M. Jennings	4,030

Under the Old Regulations.

INFANTRY.

3rd—H. L. Ainsworth 20,255

STAFF COLLEGE.

August, 1901.

The following Officers, who read exclusively with us, passed on the Competitive List:—

Capt. J. W. E. DONALDSON, Royal Field Artillery.
Capt. G. McK. FRANKS, Royal Garrison Artillery.
Capt. G. A. F. SANDERS, Royal Engineers.
Capt. A. GRANT-DUFF, 1st Bn. Royal Highlanders.
Capt. A. H. H. WILSON, 2nd Bn. Wiltshire Regt.
Capt. N. MALCOLM, D.S.O., 2nd Bn. Argyll and Sutherland Highlanders.
Capt. S. W. KING, Indian Staff Corps.
Capt. H. D. FARQUHARSON, Royal Marine Light Infantry.

And in addition, the following Officers received Nominations:—

Brevet Colonel A. W. MONEY, Royal Artillery.
Capt. A. R. FINLAY, 2nd Bn. Bedfordshire Regt.
* Subsequently admitted.

PROMOTION.

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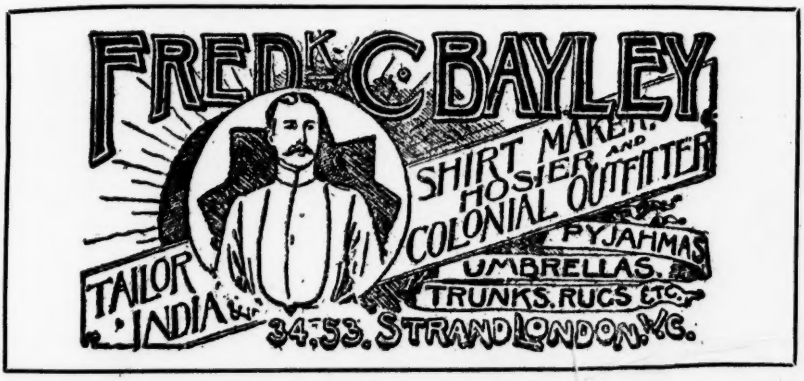

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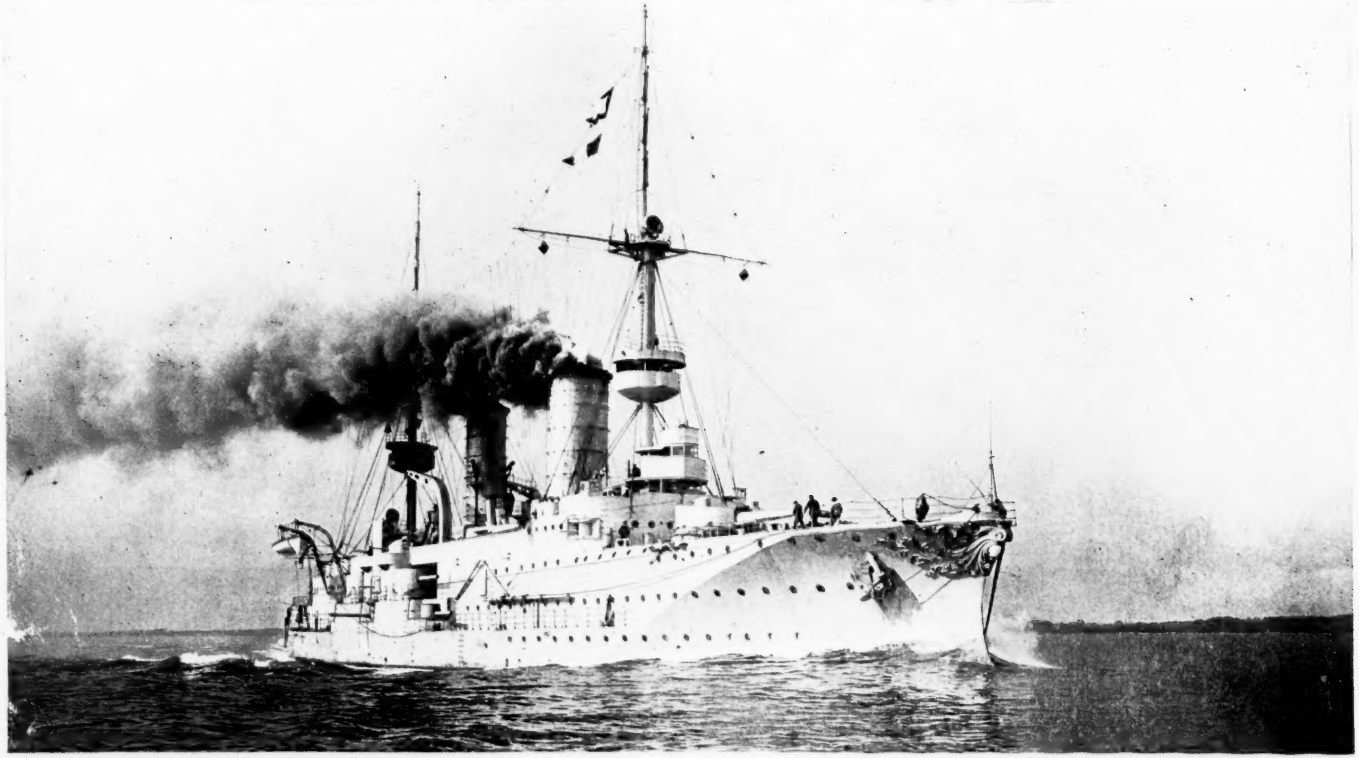

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On the occasion of a recent visit of the Prince of Wales to the Museum of the Royal United Service Institution, His Royal Highness evinced particular interest in the silver Statuette of Lord Nelson which the Council made an unsuccessful effort to acquire for the Institution by subscription last year.

The Statuette is of standard silver, weighs 893 ounces, and stands 2 feet 9 inches in height. The workmanship has been pronounced by experts to be early nineteenth century, and the modelling to be exceptionally fine. The Statuette was presented by His Majesty King George III. to the great Admiral on the anniversary of his victory of the Nile, and is, therefore, of historic national interest, as well as an object of artistic merit and intrinsic value.

His Royal Highness the Prince of Wales has expressed the hope that the Statuette may yet be acquired by the members of the Institution, and has given practical expression to this wish by graciously accompanying it with a donation of £10 to the fund if it should be re-opened. In these circumstances the Council feel that it would be the wish of the members if another effort were made to obtain the funds to purchase the Statuette. And it has occurred to them that, after the interest which His Majesty the King has always shown in the Museum of the Institution, and in view of his having lately deposited in the Museum the relics of H.M.S. "Victory" from Windsor Castle, the present would be a fitting opportunity for another appeal to the members to contribute the £500 required to purchase the Statuette, and place it in the Museum in commemoration of His Majesty's Coronation and happy restoration to health.

[P.T.O.

Contributions, which will be duly published in the Journal of the Institution, should be made payable to the Secretary, Royal United Service Institution, Whitehall, S.W. The following sums have been received :—

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R.-Adm. H.R.H. The Prince of Wales	10	0	0
Col. F. C. Trench Gascoigne	25	0	0
R.-Adm. W. B. Bridges	20	0	0
Anonymous	20	0	0
J. A. Mullens, Esq.	10	10	0
Lt.-Col. R. W. Inglis	10	10	0
Adm. Sir E. G. Fanshawe	10	0	0
Major R. H. Jary	5	0	0
Capt. W. A. Tollemache	3	3	0
Adm. Sir Erasmus Ommanney	3	3	0
2nd Lieut. C. L. Patton-Bethune	3	3	0
Lt.-Col. R. M. Holden	2	2	0
Lt.-Col. A. Longley	2	2	0
Major C. H. Wylly	2	2	0
Lieut. C. P. Wilson	2	2	0
Col. C. F. Bell	2	2	0
Commander P. Nelson-Ward, R.N.	2	2	0
Capt N. A. H. Budd	2	2	0
Commander W. F. Caborne, R.N.R.	1	1	0
Lieut. B. E. Sargeaunt	1	1	0
Major C. J. Davenport	1	1	0
Major J. F. A. McNair	1	1	0
Lieut. A. H. De Kantzow, R.N.	1	1	0
Major A. E. Bingham	1	1	0
Commander A. de C. Crawford, R.N.	1	1	0
Col. C. E. Bates	1	1	0
Lieut. G. R. Maltby, R.N.	1	1	0
Major-Gen. J. B. Sterling	1	1	0
Lt.-Col. J. Sterling	1	1	0
Capt. A. C. Clarke, R.N.	1	0	0
Capt. S. A. Johnson, R.N.	1	0	0
R.-Adm. W. H. Henderson	1	0	0
Lt.-Col. A. G. Holland	1	0	0
Capt. P. H. Wright, R.N.	1	0	0
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SANDHURST, JULY, 1902.

Marks.

5th Infantry—A. Thompson... 9,814

First trial direct; was specially prepared for a Commission in the Indian Staff Corps. Mathematics, 2,085; German, 1,835; Latin, 1,489; French, 1,429.

63rd Infantry—M. E. Yeatman 8,122

First trial after failure elsewhere; 2,886 marks increase. Mathematics, 2,017; French, 1,338; Latin, 1,170.

Honorary King's Cadet—F. S. Bradshaw ... 5,334 First trial after failure elsewhere.

INDIAN POLICE, JULY, 1902.

14th—W. H. Chadwick ... 7,694 First trial direct after two months' special preparation.

First in Geometrical Drawing, Second in Mathematics I. (2,771 out of 3,000), Second in Mathematics II. (1,750 out of 2,000), and Second in Freehand Drawing.

WOOLWICH, DECEMBER, 1901.

20th—P. H. Evans 9,748

First trial after failure elsewhere; put on 2,976 marks in three months.

First in Physics, Third in Geometrical Drawing, and Fourth in Chemistry on the whole Woolwich List. More than doubled his marks in Mathematics I.

SANDHURST, DECEMBER, 1901.

17th Infantry—N. Hudson 8,035

Second in Chemistry and Second in Geology on the whole Sandhurst List.

19th Infantry—W. H. Chadwick 7,957

First in Mathematics I., First in Geometrical Drawing, and Third in Mathematics II.

86th Infantry—C. F. S. Stewart ... 6,578 | 114th Infantry—H. T. R. S. Wright ... 6,191

Infantry Cadetship—G. F. Hutton 5,555

All passed on first trial direct, the first two being eligible for Indian Staff Corps.

MILITIA COMPETITIVE, SEPTEMBER, 1901. (New Regulations.)

ROYAL ARTILLERY. 5th—N. W. Wingate-Saul 15,559

This Candidate was prepared solely at Onslow Hall. First trial direct. Had no previous knowledge of military subjects. Period of preparation three weeks—September 2nd to 24th. Examination marks, 12,025.

INFANTRY.

—H. N. Jones ... 12,501 | —J. B. Matthews-Donaldson ... 10,529 | —H. Pigé Leschallas ... 8,398

SANDHURST, JUNE, 1901.

100th Infantry—*A. K. Robertson ... 5,744 | W.I.R.—*G. F. Archibald 5,515

Infantry Cadetship—*D. I. Macpherson 4,832

Another Sandhurst Candidate, too young to compete, was sent up from Woolwich, and made over 6,000 marks, qualifying in the aggregate of marks in Mathematics I. and II. He would have passed half way up the Sandhurst List. *First trial direct at the age of seventeen.

MILITIA COMPETITIVE, MARCH, 1901. (New Regulations.)

27th Infantry—G. S. Skinner... ... 16,193 | Infantry—P. S. Walker 8,118

29th ,, —T. C. De Trafford ... 16,009 | University Candidate—N. C. Duncan... 4,155

WOOLWICH, DECEMBER, 1900.

58th—W. James ... ... 7,249 First trial direct at the age of sixteen.

SANDHURST, DECEMBER, 1900.

FOUR PREPARED—FOUR SUCCESSFUL.

27th Infantry—*R. C. B. Williams ... 7,047 | Inf. Cadetship—H. S. Walker 4,790

64th ,, —†G. M. Richmond ... 6,117 | ,, ,, —D. M'Laughlan Slater... 4,749

*Indian Staff Corps after failure elsewhere. †First in Geology.

MILITIA COMPETITIVE, SEPTEMBER, 1900. (New Regulations.)

24th Infantry—H. T. Thornhill ... ... 13,815 | 57th Infantry—L. D. Furber 11,553

WOOLWICH, JULY, 1900.

FOUR PREPARED—FOUR SUCCESSFUL.

57th—*J. L. Mitchell ... ... 8,900 | 118th—*C. W. Smeed 7,167

96th—*§A. B. Sherrard ... ... 7,622 | — —*H. W. Walker 5,758

*First trial direct at the age of sixteen.

§Was educated at Onslow Hall from the age of 14 to 16, and passed out of Woolwich for Royal Engineers at the age of 18.

SANDHURST, JULY, 1900.

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INDIAN POLICE, JULY, 1900.

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THE JOURNAL
OF THE
ROYAL UNITED SERVICE INSTITUTION.

VOL. XLVI. OCTOBER, 1902. No. 296.

[*Authors alone are responsible for the contents of their respective Papers.*]

COMPLEXITY IN ARMY ACCOUNTS.

By Captain G. W. REDWAY, Northamptonshire Regiment (Reserve of Officers), Acting Station Paymaster.

Friday, 16th May, 1902.

Sir RALPH H. KNOX, K.C.B., late Permanent Under-Secretary of State for War, in the Chair.

I DO not propose on the present occasion to deal with any accounts but those which are more or less familiar to the regimental officer—I mean the soldier's account with his captain, and the captain's account with the War Office and the station-paymaster. These accounts are exhibited on a special army form known as the Company Pay List. With reference to this class of accounts a good deal of criticism has found its way into print during the past year or two, and the public appears to be in a somewhat perturbed state of mind about our pay system generally. That something is wrong there is abundant evidence to show, but our reformers are by no means agreed either as to the nature of the defect, its cause, or its cure. At the present moment, undoubtedly, a considerable amount of fog surrounds the whole subject, which I trust our discussion this afternoon may tend to dispel.

Complaints and suggestions on the subject of pay accounts must, however, be received with extreme caution, when it appears that the malcontents have made no serious attempt to understand our pay system, to ascertain the *raison d'être* of the pay lists, and to grasp the principle involved in making regimental officers discharge their own pay duties, while "paymasters" act as their local auditors.

Even accomplished soldiers exhibit in their writings and speeches an inability to distinguish between *accounts* and the *audit* of accounts, and very often confuse complexity in *accounts* with complexity in *regulations*.

The majority appear to be unaware that out of every hundred pay lists hardly a dozen are actually examined at the War Office, more than 88 per cent. of the soldiers' ledger accounts being finally adjusted under the supervision of local paymasters.

Our pay system, like the Standing Army itself, has grown out of very small beginnings. I need not go back to that early period when pay and plunder were interchangeable terms—to the reign of Richard I., when "a war with France was esteemed as almost the only method by which an English gentleman could become rich." Nor will I dwell on that later period when colonels of regiments acted as Government contractors, received the pay and allowances for their regiments, and made their own terms as to recruiting through their captains. Even so late as the middle of the eighteenth century an elegant simplicity in financial arrangements made it possible for the first Lord Holland, on retiring from office as Paymaster-General, to take with him nearly £500,000, and although thirteen years later his representatives paid back into the Exchequer £250,000, the balance was still owing when the Commissioners of Public Accounts reported on the matter in 1781. "If they do these things in the green tree, what shall be done in the dry?" If the Chancellor of the Exchequer could be kept out of £500,000 for thirteen years, how fared the rank and file of the Army? This question has been answered in "The Army Book" which records that "Fraud on the Government was then as much a characteristic of our Army institutions as harsh treatment of the soldier." Before the dawn of the nineteenth century, however, the foundation of our present pay system had been well and truly laid, for Mr. Burke's Act had made the Secretary at War a minister directly responsible to Parliament; and the building of barracks in 1792 was the outward and visible sign that a Standing Army had taken root among our other institutions, and that a basis had been found for a permanent system of administration. Regimental accounts were, nevertheless, still in a very primitive stage of development, and the company pay list took the form of a mere acquittance roll prepared upon a sheet of foolscap. The fact is significant, because an extremely simple account implies an extremely simple contract, and such was the Crown's contract with the soldier about a century ago.

You enlisted a man, very often in a state of liquor—or you impressed him under the Act passed in 1779—and practically enslaved him for life. You gave him 6d. a day, which you frankly called subsistence money, and expected him to "find" himself in every respect, arms and equipment only excepted. If he grumbled you called it insubordination and put him in the Black Hole; if he deserted you flogged him and branded him with the letter D.

The extra 2d. a day, which you had granted as "pay," was handed at the end of the year in a lump sum to the colonel, who clothed the regiment, and gained at least £500 a year out of the transaction. If the soldier was exceptionally meritorious, you made him a corporal and gave him 8d. a day for subsistence, and if he could write a good hand and understood accounts you promoted him sergeant and increased his subsistence money to 1s. a day. Certainly, the sergeant's full pay was 1s. 6d., but as the colonel's off-reckonings for a sergeant's clothing came to 6d. a day, of course the veteran's cash receipts did not exceed the sum now handed daily to a recruit. No further promotion, no extra emoluments were then possible for the non-commissioned officer, who had to support himself and his family on a shilling a day and whatever he could extort from the privates. His military career would in the most favourable circumstances be closed by his discharge at forty as "worn out."

This state of affairs, distressing as it appears to the modern philanthropist, had one feature which must commend it to those who bewail complexity in Army accounts to-day. The very simple contract I have outlined of course resulted in a very simple account; and if simplicity in Army accounts is the *summum bonum*, we have only to revert to the barbarous customs of the eighteenth century in order to attain it. Complexity in pay accounts, on the other hand, is the direct outcome of those beneficent changes in the conditions of Army life, for which the Victorian era is remarkable, and which promise to continue in the reign of Edward VII. Every successful attempt to better the soldier's lot, to increase his comforts, to reward skill at arms, to encourage good behaviour, to substitute fines for flogging, to promote thrift, to protect him from oppression, and make soldiering to N.C.O.'s at least a real profession, eventuated in Regulations by which the soldier's original contract was modified to his advantage, and a century of such humane legislation has resulted in a body of regulations which are certainly very complicated, but which—as the Accountant-General pointed out to the War Office Committee—cannot be touched without disturbing vested interests in which the public is as much concerned as the soldier.

Those who are familiar with attestations will be aware that army form B 265 constitutes only one part of an elaborate contract, the other part of which is expressed in the Pay Warrant and Army Regulations in force on the day of enlistment. The soldier is told when he enlists that these regulations can never be altered to his disadvantage, and therefore he knows the worst that can befall him as regards pay and privileges, but he is cheered by the prospect that any morning he may wake up and find that a grateful country has increased his military income by 25 per cent., or even 50 per cent. This would be brought about by a new regulation; the new regulation would, of course, alter the original contract; and

such alterations in the contract give rise to what is called complexity in army accounts. On the very day that I write these words a special army order has granted an extra £3 a year to every soldier now serving who fulfils certain conditions, and an undertaking has been given that those men who continue serving till April, 1904, will then hear of something further to their advantage. Of such sources of complication in pay accounts we in this Institution can only say, May they flourish! It would probably take me all the afternoon to recite the precise terms of the actual contract now existing between the State and its soldiers. Every probable contingency is provided for by an elaborate code governing the pay, extra duty pay, corps pay, working pay and good conduct pay of the soldier, and the various allowances granted him for rations, groceries, travelling, lodgings, fuel and light, besides the special gratuities for long service and war service—every issue of which varies with his rank and status through nearly a dozen grades from "boy" to "warrant officer."

Few of us who pay taxes can regret the existence of some 500,000 of such contracts to-day. But, as tax-payers, we require some assurance from time to time that these contracts are being regularly carried out in their integrity, and that the sums separately voted by Parliament for a hundred and fifty different purposes are being strictly applied to those purposes and to no others. We, therefore, appoint officers who are supposed to be educationally qualified to administer the Army, we give them the rank and pay of captain or major, we authorise them to obtain funds, and we expect them to faithfully discharge the Crown's obligations, in respect of every soldier in their respective commands. The soldier's ledger account, as certified by his captain, becomes legal evidence to all whom it may concern, that the contract between the Crown and the soldier is being regularly carried out, month by month; and if there be any more important military duties than these—duties under arms, of course, excepted—I confess I do not know them; for upon the intelligent discharge by officers of their administrative duties depends the well-being of the rank and file and the ultimate popularity of the Service.

It is, therefore, much to be regretted that so large a number of officers tacitly agree to shirk these duties, and leave them as far as possible in the hands of their subordinates. The fact is notorious. The leading Service journal has declared that "nothing is so confusing or annoying to the ordinary regimental officer as the duties connected with the payment of a company. He has had no preparation for such functions, and hates them. Consequently he too often leaves the matter in the hands of his colour-sergeant, who sometimes, either from stupidity, carelessness, or dishonesty, involves the officer in a loss." The attitude of other officers towards their pay duties may be gathered from such a statement as the following, which was made to me a short time

ago :—"Nobody understands these pay lists, and if we were meant to understand them we should have been put through a course of instruction in account-keeping, the same as in tactics and musketry."

On the other hand, the authorities take it for granted that an officer's standard of general education should suffice to enable him to learn at least as much about accounts as his pay-sergeant, and the War Office has of late years provided him with an account form so constructed that, with ordinary care and intelligence, the accountant can hardly go wrong. And yet it has been stated quite recently by the editor of a Service journal—not the one I quoted before—that "during the past two years a number of company officers at home stations have had to make up deficiencies of their company accounts, which in some cases ran into three figures."

It really seems as though a deadlock were about to be created in regard to this matter of the company pay list; and the apparent misunderstanding between the War Office and the regimental officer has no doubt been fostered by the publication of a certain paragraph in the Report of Mr. Clinton Dawkins' Committee on War Office Organisation—I mean paragraph 52, relating to the company pay list, which I will quote to you verbatim :—

"The accounts of the company officers, who act as sub-accountants, are comprised in the company pay lists. The Committee are decidedly of opinion that *these pay lists are unnecessarily complicated*, and they were informed that *these complications, while unduly occupying the time of officers, also cause much misunderstanding and dissatisfaction among the men.* To take a conspicuous instance, the messing allowance should be treated as pay. Various small deductions or stoppages, *e.g.*, for hair-cutting, libraries, etc., are a further source of complication, and should cease to be a direct charge against the soldier; while it is also desirable to simplify the various rates of duty pay. Again, too, *the present system of accounting for clothing and money compensation in lieu of issues in kind is extremely obscure and highly complicated.* It is strongly recommended that these questions should be at once taken up with a view to rendering the pay lists simple and intelligible. These reforms will materially reduce the clerical work of company officers." Here is an attack on a system and an army form, of which the Committee could have learned very little from the witnesses called by them; for the evidence of practical men, such as regimental officers, company accountants, and station paymasters, was—to use a well-worn phrase—"conspicuous by its absence." What was "extremely obscure and highly complicated" to the Committee is quite possibly "extremely *obvious* and highly *methodical*" to an infantry colour-sergeant or a battery accountant, who uses Army Form N 1505 every day of his life. Then the Committee appear to have taken quite seriously somebody's statement to the effect that "these

complications, while unduly occupying the time of officers, also cause much misunderstanding and dissatisfaction among the men." I cannot help wondering where these officers are to be found who spend an "undue" amount of time upon their pay lists—all evidence on this point goes in quite the opposite direction—nor have I ever heard of "misunderstanding and dissatisfaction" among the men of the six or seven different companies of Line and Militia infantry which I have had the honour to command from time to time in four different corps.

The situation, I believe, is simply this: An officer who possesses the average amount of experience and intelligence, and who devotes a reasonable amount of time to his administrative duties, has no trouble of any sort with his pay lists, or his men; and the officer who complains about obscurity and complexity in the pay list must be one who purposely abstains from making himself too familiar with the army form in question. That a company pay list can ever approximate to the wages roll of civil life is, of course, impossible under existing conditions of enlistment; and the nature of the services rendered under the British soldier's contract with the State forbids comparison with so-called "business" procedure. It is equally chimerical, in my opinion, to talk—as many do—of relieving the regimental officer of his pay duties because he systematically neglects them: by a parity of reasoning you should relieve him of field duties when he displays an ignorance of tactics. But you require the regimental officer as an administrator quite as much as a fighter; and he should study administrative duties just as he studies field engineering and musketry, more especially that branch of administration which requires him to present a series of accurate "pay" accounts. The pay list must of course be controlled by the regimental officer, so long as the emoluments of soldiers depend on daily occurrences of which nobody but the regimental officer has cognisance; even if the soldier received his cash payments from the hands of the local postmaster—as pensioners do—it is the regimental officer who must decide what sum he should receive on presenting himself. The regimental officer alone knows whether A is entitled to messing allowances, B to good conduct pay, whether C has been fined, or D forfeited pay for absence, whether E can claim a species of board wages by reason of furlough, or F is entitled to money in lieu of boots or tunic.

The experiment has already been tried of issuing the balance of deferred pay to soldiers on discharge through the station paymaster instead of the captain. Is the procedure simplified? On the contrary. The station paymaster is obliged to call upon the regimental officer to state in writing every circumstance throughout the whole of the man's military career which may possibly affect his daily 2d. of deferred pay. Now, speaking as a regimental officer, I regard it as a positive loss

of time and waste of labour to give all this information in writing to a distant paymaster rather than "do the sum" myself and pay the money, for in no case can the regimental officer rid himself of responsibility. If he err in his statements, and a discharged soldier is in consequence overpaid, his sin will find him out as soon as the A.F. O 1616 reaches the War Office, and a disallowance will be the result. Why then split up an issue of deferred pay into two portions, of which the captain pays one and a paymaster the other? The experiment of issuing deferred pay through paymasters shows, I think, how unpractical is the suggestion that *all* emoluments should be issued by paymasters. The fact is that "command" and payment cannot be divorced in the Army, and it is difficult to understand how anyone not entirely ignorant of the situation can believe that a soldier can be settled with independently of the officer who keeps his documents and knows every incident of his daily life as a soldier. That officer is the regimental officer.

We begin now to arrive at the conclusion that the remedy for what is called complexity in army accounts will not be found in measures by which regimental officers abandon their pay duties, nor by tampering with army forms, nor by altering a system which has stood the strain of a long campaign of unprecedented difficulty. What Mr. Clinton Dawkins' Committee said of Army administration in general, applies with special force to pay duties, "into any system of administration, however theoretically perfect, the personal element must largely enter"; and I believe that the solution of whatever difficulties exist in connection with the company pay list will be discovered, if at all, in measures by which a keener appreciation of the importance of that special branch of their administrative duties, on the part of regimental officers, will become apparent. How can this desirable change be brought about? Obviously, by careful instruction in the first place. At the present moment young officers are required to pass an examination in interior economy, which embraces the "system of keeping books, accounts, and returns of a squadron, battery, or company"; but as long as this subject is grouped with many other subjects under the head of "Regimental Duties," and as long as the examination is conducted by officers, who, having themselves no special knowledge of account-keeping, are unable to apply any crucial tests of efficiency, the officers now learning their trade in the Army will, of course, continue to avoid acquiring any real knowledge of pay duties.

Oddly enough, their subordinates are in a very different position. The coveted rank of colour-sergeant is attainable only by the N.C.O.s who display, among other military qualities, some proficiency in army accounts, and the N.C.O.'s zeal is further stimulated by the knowledge that, as company accountant, he will earn extra-duty pay at the rate of 1s. 6d. a day. These are powerful incentives to study, and the result is

that the colour-sergeant becomes possessed of information on this important subject which is not shared by his captain; and, as Knowledge is Power, the regimental officer too often becomes a mere tool in the hands of his company accountant. Upon the whole, I am bound to say, the pay sergeant uses his power with discretion; but it is, nevertheless, an inversion of the order of things contemplated by regulations and common sense, that the regimental officer should be at the mercy of his subordinate in regard to his pay duties. That such is too often the case will, I think, be denied by nobody. Evidence on this point was given by one of the Accountant-General's assistants, Mr. G. P. Wight, who says: "The company officer loses or muddles away the cash. When I say company officer, I should add that very often he does not pay any attention to the matter; he is supposed to pay his men, but he does nothing of the sort." That statement is perfectly accurate if applied to 90 per cent. of regimental officers, and the exceptions that prove the rule by their shining example exhibit these *lâchetés* in their true light.[1]

An excuse very often urged by regimental officers is "want of time," but we all know that the busiest man in a company is the colour-sergeant; and if the colour-sergeant can find time, in the intervals of drill and orderly duty, to educate himself as an accountant, it ought to be comparatively easy for the regimental officer to do so, especially if he serve in an infantry corps. In this connection it is perhaps worth noting that in regard to administrative work—and pay duties in particular—the battery has somehow reached a far higher plane than the company, though the care of horses and guns as well as men would justify the Royal Artillery officer, if anyone, in complaining of overwork. It is the infantry unit, however, which pretends that its officers are, in some mysterious way, either intellectually unfitted to discharge the administrative duties connected with a company pay list, or so overwhelmed with other military duties that they are precluded from studies which are successfully pursued by their own sergeants. Their apologists often urge that, since regimental officers are never *instructed* in pay duties, they ought not to be expected to discharge them properly, and that Royal Artillery officers and others who believe in self-education are performing works of supererogation. That is at least an intelligible argument, though not one which a keen and capable officer would care to use; and the military authorities might well consider whether substantial help in this direction could not in the future be given

[1] The Commander-in-Chief is again complaining of the number of letters addressed to the War Office by soldiers having grievances, which in many cases is attributed to the carelessness of officers in not enquiring into complaints on the spot. Most of the letters concern pay due to the men, either as gratuities or allowances.

to all officers on joining. So far as I know, the only official sources of information at present available to the officer who wishes to understand his company accounts are the station paymasters, and a pamphlet entitled "Instructions relating to the Pay Duties of Officers, etc." Now, it is true that the station paymaster is required to be ready at all times to furnish advice and information on financial matters to other officers of the Army; but it is not "advice" but systematic instruction that is needed. The pamphlet referred to is full of most useful memoranda for a competent company accountant, but it certainly will not assist the beginner to distinguish Dr. from Cr.; and it is a grounding in first principles—not empirical cramming—that is required by young officers.

What an extremely important bearing this matter of accounts must have on the future of the Army will be obvious if you consider what effect would be produced upon the War Office by evidence of ability as accountants and administrators on the part of regimental officers generally. This, and this alone, will enable the War Office to do the one thing needful by way of simplifying our present procedure, viz., to dispense with a large number of documents called Vouchers to Accounts, which are, in fact, mere checks on administrative officers. When a regimental officer issues the messing allowance to a soldier and charges it in the proper place in a pay list, the auditor should only need to check the account by means of a ready reckoner; but at present, as we all know, the charge will not pass without two certificates—one signed by a colonel and a medical officer, to the effect that the soldier is really and truly of a certain age, and the other signed by the colonel, certifying as to the period under training. The same sort of process is gone through when a claim for good conduct pay is put forward; and when a claim for lodging allowance is made, a colonel's certificate must be countersigned by an Army Service Corps officer. Now, why cannot the War Office take the captain's word that the conditions are fulfilled in each case? Clearly because it does not trust him as an administrative officer. And there is every excuse for this want of confidence, so long as officers are found who assert that they have "no time" for these administrative duties, or complain that the company pay list is a document that "nobody" understands.

I can but lightly touch on what is undoubtedly the great blot on our pay system, viz., the apparent necessity for proofs of payments, certificates, written statements, vouchers, etc.—all most admirably designed for a single purpose, viz., to keep regimental officers straight. To what dimensions this distrust of officers has grown may be seen by examining the clothing vouchers. The voucher for free issues of clothing in the mounted service embodies no less than eight certificates. The master tailor, the master shoemaker, the marker, the O.C. battery, the quarter-

master, and the commanding officer must all sign somewhere on the paper to satisfy the War Office auditor that there is "no deception." Such artificial support is, of course, a serious reflection upon regimental officers. It implies inefficiency or carelessness, and is naturally resented by those officers who do understand and who religiously perform their pay duties. But what would you have? Who could advise the War Office to remove the checks it has imposed on maladministration as long as regimental officers as a body parade their contempt for "office" work? But so soon as they profess and exhibit an interest in duties which have so important a bearing on the State finances, and indirectly upon the discipline and efficiency of the Army, we cannot doubt that these checks and leading strings will be abolished; for the cost of printing the army forms called vouchers, the cost of labour in filling them up, of postage in forwarding them, and of clerical labour in examining them must be prodigious.

A considerable sum might be saved by the abolition of these vouchers, and if the sum thus saved were distributed as extra duty pay among the officers instrumental in saving it, a most valuable object-lesson would be presented to the Army. It is the hope of reward that sweetens labour, and we might expect such practical recognition of "profit-sharing" principles to vitalise all duties connected with the company pay list. It was once the custom for a captain to receive a contingent allowance—about £40 a year—and this he was expected to hand over to the subaltern who relieved him of his pay duties. No doubt junior officers in those days took special pains to qualify for this paid appointment, but when the allowance was withdrawn, and the duties increased, the interest of subalterns in pay duties disappeared; and what they did not themselves learn as subalterns they could not teach or demand in later life from those who served under them. The stage has now been reached when it is considered "good form" to profess entire ignorance of pay duties, and the office work connected therewith; the habit is confirmed among the older officers, who give the cue to every subaltern on joining.

This is no light matter. In every subaltern we see a potential general, and, with decentralisation in view, it would hardly be possible to pay too high a price to ensure that the regimental officer should need less supervision in the future than in the past; that he shall be as self-reliant in peace as in war, and as perfect in administrative duties as in duties under arms. The Army has demanded decentralisation, and it is now within measurable distance; it is obvious that decentralisation must include a large grant of what is called financial control. Does the Army quite realise what this involves? Real decentralisation will throw upon regimental officers the class of duties for which they say they have had no

preparation, and the kind of responsibility which they say they detest; it will demand from them, moreover, the exercise of faculties which recitations from the Drill-books have failed to develop, and for which no amount of war service is a substitute. In these circumstances there are many beside myself who think that the outlook for decentralisation is most gloomy; its prospects seem to depend upon whether regimental officers now in the junior ranks can be induced to set their house in order without further loss of time; and in this connection I venture to suggest that they would find no better schooling for much of the work of a modern general than regular exercise with the "complications" of a Company Pay List.

My task for this afternoon is finished. Nobody can be more sensible than myself of the sketchy character of my performance, but a thirty-minute lecture is not the vehicle for a finished picture of our pay system and a detailed account of the measures necessary for its efficient administration. I can only trust that the rough outline I have given—in a paper intended to be suggestive rather than exhaustive—will provoke expert criticism, and so draw attention to a subject which I believe has never before been debated in this theatre.

Colonel P. H. SMITH (late Devonshire Regiment):—I have listened with a great deal of interest to Captain Redway's paper. While I agree with a great deal he has said, I also disagree with a large number of his assertions. The complexity which undoubtedly exists in Army accounts is not due to any connection with the combatant branch of the Army. It is due simply and solely to the non-combatant branch, who insist on having these returns and useless and unnecessary vouchers. That I believe to be the cause of the whole of the trouble. Vouchers and returns which are alike useless and unnecessary are demanded, and on that I am prepared to join issue with anyone. The author states—I dare say it is his experience, although it is not mine—that many company officers shirk their duties connected with the accounts. That is not my experience. I joined the Service many years ago. I was for 14 years a subaltern, and for 12 years I was in command of a company, and during the whole time I was in command of that company I was able to make out my pay lists. I could have done it without a colour-sergeant, and I very often did, and I believe my experience is that of nine officers out of ten in the Army. The tenth man, I must acknowledge, neither knows nor cares much about it, and he has to put his hand in his pocket and pay for his experience. The lecturer goes on to state that the attitude of officers towards the pay duties may be gathered from a statement made to him with regard to these pay lists. The pay lists are simplicity itself. Anybody can understand them who is capable of that small amount of arithmetical knowledge which passes him into the Army. I will not say he will not have the pay list returned to him. He will have it returned to him—not once, but 50 times. That pay list will become the bane of his existence for six months. He will have item after item sent back to him, as I have had them sent back to me, marked "insufficiently vouched for." That was the only assistance I ever got from the paymaster. When the officer has argued the point with the paymaster for six or nine months the same vouchers which were insufficient in January are passed in September. That is my experience, and it is the experience of a great many other officers. "Insufficiently vouched for"—I know the words, I have seen them very often. "The pay list must

always be controlled by the regimental officer, because the emoluments of soldiers are affected daily by occurrences of which nobody but the regimental officer has cognisance." I, as the commanding officer of a regiment, have had half my officers, and very often two-thirds of them, away from the regiment for months at a time. No sooner did a youngster pass in one subject than he went off to some other class; no sooner did he come back from that class than he went to another class—say musketry. No sooner did he come back from musketry than he went off to signalling. So it went on year after year until you did not see your officers for six months in the year, and in those six months you had probably to put them in command of three or four different companies, the other officers being away. The only other man who knew the accounts of the company was the man who was permanently with it—the colour and pay sergeant, and no two men can do one man's work without muddling it. If the officer during the short time he was there went through the pay lists he would be equally ignorant and would have to refer the matter to the colour-sergeant who was there and who knew everything about the men. The colour-sergeant was prepared to answer these objections, which came back at the interval of months—I may say at the interval of years sometimes. He was the only man who knew anything about them. The captain was away. The captain was doing the assistant adjutant-general's work; he was doing the deputy quarter-master-general's work; he was, it may be, signaller; he was doing anything, in fact, but work in the company. As long as that system lasts—and I believe it always will last—the only man you can really look to for information on the company's accounts is the colour-sergeant. The officer may know the accounts, and he generally does, but the man who works them out must be the man who is there, who is ready to answer all objections. Without going further into the items, I only wish to point out two or three items in which the paymasters generally are willing to assist you. They are always willing, but very often not able. Many years ago I was adjutant to a wing in India. When we got to the station we were told that we should always have trouble with our pay lists. We did. We were also told what to do, and we did it; that is to say, the system which was carried on during the time we were there was the regular standing thing. Owing to the peculiarities of barrack construction we had to employ a considerable number of coolies in addition to those vouched for. For this additional establishment we had to send in vouchers, and they were sent. I was at that station for over two years, and every time we sent up that pay list it came back again with the same old words, the dear old joke, "insufficiently vouched for." That was about 26 years ago. If I were sent back to the same station I believe I should find the same old game being played now. I am perfectly certain of it. It went on, to my own knowledge, for six years, and there has been no change in the department since, or in the work of it either. How will you train officers in the keeping of regimental accounts? You really have not time; you have not time fairly to teach them their drill. By the time they know all the little odds and ends which are now insisted on by different people they are grown up and away. They are qualified for assistant adjutant-generals, and leave before they know anything about regimental affairs at all. The regimental officer is not with his regiment, and as fast as he can he gets away from it, because, owing to the wonderful system in the Army, if you can get your name down for the staff and get a staff billet, you get a cocked hat, and you teach other people, while you are entirely ignorant of the duties which you have to teach them. I should like to read you the following quotation from the *Army and Navy Gazette* of 10th May. It refers to pay lists. This is the statement of a lieutenant-general on the War Office pay list:—"Form 1.—A more complicated piece of arithmetic it has never been my lot to see," &c. That is written by a lieutenant-general who ought to know something

about Army accounts. That is the way we are at present simplifying Army accounts. Now I am afraid I shall say something which will be displeasing to the Chairman. It is not the interest of the civil branch of the Army to simplify accounts, because if we had simplified accounts we could reduce that branch of the Service considerably. At present, if you have the useless accounts that we now use you require a large number of men to look through them, but if the accounts were simplified and the vouchers dispensed with to a certain extent you could probably do away with a third of that department, which, I acknowledge, would be a great thing to do; but it is not the wish or aim of the department to do it, and until it is the aim of the department to simplify accounts it is perfectly useless for any combatant officer to attempt to do so. That is my experience, and it differs considerably from the lecturer's, I am sorry to say.

Major E. C. HAWKSHAW (late R.A.):—I have listened with a great deal of interest to this lecture on Army accounts, because it is a matter to which I have paid a good deal of attention. Having commanded batteries for a good many years, I took a great interest in the subject—not that I ever received any *special instruction* with regard to these things, but because I happened to be under the soundest commanding officer I ever had (the late Colonel Warter, R.H.A.), when I was in a battery of horse artillery. He one day said to me: "We have an excellent battery staff. Therefore go in and learn every detail you can with regard to the accounts, for some day you may perhaps have a bad battery to pull together." And I did. I went into the whole thing, and I got it all at my fingers' ends. My experience with regard to batteries corresponds very much with the last speaker's remarks. Practically there is one responsible officer in the battery. I once was promoted into one that had been in Ceylon for nine years. Before I joined it to take command it had been under the command, of a gentleman who preferred—to put it in plain language—whisky or gin, whichever it was, to accounts. The consequence was that, to my certain knowledge, nothing had been accurate in the way of accounts for nine years. They had never been properly checked, and yet not a single one had come back for correction. The books were in simply a chaotic state. I found that the sergeant-major used to go round and tell a man that his subscription to something was a rupee (*sic*), and the man simply said, "All right, sergeant-major." Then the sergeant-major would go round a little later and get some more out of the men for something else. Eventually the sergeant-major was tried by court-martial and smashed for cheating. That was the sort of thing that had gone on! I will give you another instance of it. A bombardier went to a gunner at the end of a month and told him to sign his accounts. Signing in the presence of an officer was a thing that had never been known! The gunner looked through the accounts, and said that they were not right; so the bombardier replied: "You do as I order, or I will put you in the guard-room." The man said: "Very well, I *will* sign them"; and he took up the book and wrote on it "incorrect," and he was perfectly right, for it happened just before I arrived, and I personally investigated the case on hearing of the whole thing. He was made a prisoner and was eventually brought up before the lieut.-colonel, who had given him a stiff regimental entry for what he had done! Nobody would believe these things unless they knew them for certain. I had a cut in, and eventually, I am happy to say, pulled them straight. As regards only one man knowing anything about the accounts, that is a thing I should like to say a word about. As time went on, I found myself in command of a depôt at Colchester, where there were a large number of men. It was perfectly hopeless to run a battery with a quartermaster-sergeant alone, so I split up the battery, placing each section under a bombardier, with the quartermaster-sergeant over the whole remunerating the bombardiers for their work. It answered admirably.

Decentralisation is what is required, and if a man had his pay lists in good order I told him he would be promoted. With regard to officers bothering about this question, that fact has come very considerably before the public during the last two or three years. The discipline of officers was not stiff enough, in fact there has been little or none. If an officer says he will not bother about his accounts, why should not you say to him, "Until you have your accounts in proper order you will not be promoted"? You do it to the non-commissioned officers; why not do it to the commissioned officers? It is absolutely and totally subversive of all discipline to have the accounts wrong, and you must have things right if you want to have contentment in a corps. As for the signing of the accounts, in every battery that I have been in every man signed in the presence of an officer at the month's end, and if a man said that his accounts were wrong, I had him up and asked him where they were wrong, and put everything right. If you inquire into the matter, you will find there will be no more bother. With regard to these vouchers, that rather hinges on what I said before: that if they would only let a commanding officer be a commanding officer, things would work smoothly. It is so wrong to put a man in command of a regiment and then say: "I do not believe a word you say. You must bring some other proof." His power is then gone. Let him run his own show. Let his accounts be inspected; and if he is wrong, walk into him and say: "You cannot keep your command in proper order, and until you do so you will not be promoted." That is a simple and soldierlike way to meet the whole question, and it will cause content throughout the Army. But where we have been bothered so much is, that there is no inducement to keep things right. If you *did* keep your command right throughout, that did not mean that you got on in the least. The commanding officer ought to be selected for his capacity as a leader of men, given a free hand and backed up, unless there is something very wrong. There will then be more contentment in the Army, and you will be able to get rid of the difficulties which at present exist. Nobody, except those who have been in the Army of late years, knows what the conditions of service have been in reality. It has been too ludicrous! In the future, if we wish to be efficient, I venture to advocate the most rigid discipline through the commissioned ranks, as well as the lower ones, and the severest penalties for any abuse of position by unconfirmed and inaccurate confidential reports on subordinates by commanding officers or general officers. This, combined with promoting those who prove themselves good soldiers in peace or war, and not the latter alone, will give England a contented and reliable Army.

Colonel J. G. UPPLEBY (late R.A.):—I will endeavour to make my few remarks on this most interesting paper as brief as possible. The first point I should like to speak about is where the author says: "We give them the rank and pay of captain or major, we authorise them to obtain funds," etc. As the first speaker says, that is generally what they do not do. A young subaltern of 18 months' service is called in to command a battery or company. He does not get extra pay, but has all the responsibility, and a very small contingency allowance to see him through the risks. In my own case I was told by the colonel that I ought not to expect any leave, because I had been enjoying the emoluments of the command of a battery for nine months. Those emoluments amounted to about 2s. 6d. I think it is a little hard on a young subaltern who has all these responsibilities that he should have no extra pay and no allowance to pay him for the extra work and cover the risks, because there are risks. The next point I wish to speak about is where Captain Redway says: "An officer who possesses the average amount of experience and intelligence, and who devotes a reasonable amount of time to his administrative duties, has

no trouble of any sort with his pay lists." I think that is hardly fair, and in that connection I will tell you my own experience. I was in command of the depôt company of the Southern Division R.A., consisting of some forty-two batteries. Those of the batteries serving abroad sent all their men home to this depôt to be passed into the Army Reserve. I was responsible for passing them into the Army Reserve, for paying them their deferred pay, and for sending them to the most distant parts of Scotland and Ireland by the shortest and cheapest route. I had no assistance to find out what was the shortest and cheapet route. Generally the steamer is cheaper than the railway. Supposing that I sent them on by steamer and they arrived at a place on Saturday night and there was no steamer to take them on. I then become liable for detention allowance. That was charged to me perhaps two months after the men had been sent into civil life. Prompt audit is what we want while there is time to recover these sums. When I tell you that my pay-list was close on £4,000 for one month, and that I received no contingent allowance to cover risks, I think you will see that it is not quite so small a matter as the lecturer said. I think nothing has caused so much bad blood as the sort of statement made by Mr. G. P. Wight, one of the Accountant-General's assistants. He says: "The company officer loses or muddles away the cash. When I say company officer, I should add that very often he does not pay any attention to the matter; he is supposed to pay his men, but he does nothing of the sort." I do not know Mr. Wight. He may have a great knowledge of regimental officers or he may not, but I think that sort of statement breeds a terrible amount of blood; the regimental officer does not like it. Unless Mr. Wight possessed exceptional means of knowing the habits of regimental officers it is not a statement which, in my opinion, he ought to have made, because it is a statement which does not smooth matters between the civil branch and the military. Then, again, I agree with the first speaker in his opinions—and I make the remark with all due deference, because we have the late Permanent Under-Secretary of State for War present, that certainly the combatant branch of the Army as a whole doubts very much whether the War Office has any real desire to simplify these accounts. They make work. The Army does not believe there has been any real honest desire to remove all that work. There must be a great many clerks, and they know the establishment will be very largely reduced if all that work disappears. That is only human nature. I certainly thoroughly agree with the first speaker in that particular. I must say I rather deprecate the whole tone of the lecture in throwing blame on the regimental officer. I think that sort of thing breeds ill-feeling. It does not tend to smooth the working between the department and the regimental officer, and I think a great deal of it, with all due deference, is not true.

Colonel C. M. WATSON, C.M.G., R.E., *p.s.c.*, D.-I.-G. of Fortifications:—I have had some experience of the military service outside the War Office, and I have also been employed in the War Office, and can regard the question, to a certain extent, from both sides. My feeling is that the War Office do not quite understand that officers in the Army are trying to do their best. If the War Office could only realise that when an officer signs a certificate he means that that certificate is true, the difficulty might be solved. The War Office require a number of certificates and a number of vouchers, and then they want somebody else to certify that the certificates are right. The great majority of officers want to keep their accounts properly, and if some do not do it at present it is because they feel they are not trusted and that the real responsibility does not rest on their shoulders. I have studied the German system a good deal, and the reason that it succeeds is because each individual is made responsible.

The captain or the squadron-major is made responsible for his unit, and if he fails in his accounts, or in his drill, or in his discipline, the colonel comes down upon him, but the squadron-leader has nothing to say to the German War Office. He is only responsible to his colonel. In the same way the colonel is responsible, both with regard to the discipline and accounts, to his brigadier, and so on. There is individual responsibility. But in the English service the same individual responsibility does not exist. All our accounts would be simplified, vouchers could be diminished, and the whole system could be reduced to a much simpler plan if only the War Office—and it is the business of the War Office—would spread through the Army the principle of individual responsibility, and that each officer has to look to his immediate superior only.

Colonel P. H. SMITH (late Devonshire Regiment) :—May I add a few remarks to what I have already said? A considerable time ago I commanded a wing in India, and one day I was rather shocked at receiving an application for a refund of something like 6,000 rupees, which was addressed to me as major commanding, for the disappearance of some European tents. They ought to have been returned at Agra four years before. I never was at Agra. The regiment certainly marched through Agra four years before, and after four years that was the first intimation to the regiment that anything was owing for European tents. In the whole wing there was not one officer, only one non-commissioned officer, and not more than six men, who had been at Agra. How can you carry on any system of accounts where you are liable to a charge like that? I do not know what became of it. Whether it was remitted to the regiment and eventually had to be paid by the commanding officer, I do not know. But that is the system of accounts which is such a bane to the Army. If any officer is liable to have a charge sprung on him after four or five years, things will never go right. Six thousand rupees is a very considerable sum of money, and yet under our present system any officer may be liable to a charge like that. There is no system of check or audit. It is the want of system which is our curse.

Captain G. W. REDWAY, in reply, said :—I intended my paper to be rather suggestive than exhaustive, and it appears to me now that such a very large number of questions arise out of it that it is really hopeless to attempt to deal with them all in detail in the time at our disposal this afternoon. What I said about regimental officers were really quotations from those Service journals which are supposed to represent the opinion of the Army. I did not quote nearly as much as I might have done. For instance, here is another article of the 3rd May from the *Broad Arrow*, and it runs exactly on the same lines as the other letter that was quoted. I did not quote the letter of the lieut.-general mentioned, although I saw it. In fact one can see every week or every fortnight many communications all pitched in the same key I was very careful not to put in my paper anything that was not borne out by substantial evidence. My own opinions are seldom expressed, and in regard to them we may, perhaps, agree to differ. Then a speaker pointed out, most justly, that it is not very often that the captain or the major—men of experience—run the company, but a youngster. I know that is a fact—a regrettable fact. If a commanding officer chooses to appoint a youngster with a few months' service to command a company that is not the fault of the War Office. Opinions may differ as to what a commanding officer might do under the circumstances. One can imagine a commanding officer writing to his general :—"I have no one to command the company except a very young inexperienced officer, and I decline to put him in charge." Then the authorities would know just where they stood. There was some trace of the old antagonism between the civilian branch of the War Office and the Army in the remarks of previous speakers.

Of course it is obvious, as I pointed out in my paper, that the accountant and auditor must always be somewhat at loggerheads. It is useless to disguise their respective relations. One is a check on the other, undoubtedly. Take up any newspaper you like and look at the balance sheet of a public company. It is vouched for by certain officials who had been sent into the company's offices to see that payments had been made in accordance with the Articles of Association, and that the concern was being carried on properly. As we know, when companies come to grief, the first question is, Who are the auditors? You cannot get rid of the fact that you must have public auditors for Army accounts, and that there will always be some slight difference of opinion between the auditor and the accountant officer. The only thing I want to make clear is that the stronger the accountant element the weaker the auditor's may be, and *vice versâ*. If you have a notoriously weak staff to keep the accounts, you must have a very strong staff of auditors. My point is that, if the regimental officers were to the extent, we will say, of 90 per cent. of the type of officer who has spoken here to-day, men who were thoroughly familiar with their accounts, who had studied them and mastered them and run their own show, the civilian auditor might be to a large extent dispensed with, for no complexity in Army accounts would exist. But I am very much afraid that the reverse is the case: it is the 90 per cent. who are of the other sort. While upon that subject I should like to say I am very far from denying that there are among the remaining 10 per cent. some really wonderful regimental officers in the Army. One of these officers happened to write me a letter the other day, which I thought I would read here, because it shows that you do get a certain percentage of extremely able officers. I may say that he is an artillery officer and commands a depôt battery, I should think about 500 strong. As a battery commander he does a good deal of administrative work that would fall upon the commanding officer and the adjutant of an infantry corps, and yet this O.C. depôt R.F.A. gets through all of it without a hitch. He says:—"I hate accounts of all sorts, but as I have to do them and be responsible for them, I made the effort to master the system; and I now think they are simple enough in principle, although the five books I send you every month are certainly voluminous. If every officer were compelled as part of his examination for lieutenant before receiving a rise in pay to open a pay list dealing with, say, six names of individuals who represent the various possibilities of what is paid and deducted from a soldier, and complete the various forms, even to a balance-sheet, I believe we should have less of the difficulties which to a great extent are imaginary. After all, what is required of the officer is to be master of the principle, to know what is right, and to be able to trace what is wrong; the clerking labours for him are not excessive. Surely we have in the Service no officer who could not grasp the essentials, and, if required, do a whole pay list, if that officer gave the subject one clear week's study. I agree entirely that the company officer must be the payer of his men, and the paymaster the auditor. I should be sorry to face the daily return of casualties I should have to supply you with if I handed the paying out over to you." I think that is a most valuable letter, as coming from a regimental officer who is to-day practically engaged in the most onerous pay duties connected with demobilisation. I was very glad to see that he does not wish to hand over the pay, including, as it would, a large part of the administration of his battery to another branch of the Service. We have his word for it, that an officer may, by giving the subject one week's study, master the principles of the pay list, and it is the principle that the officer requires to know—not the detail. People forget that when you say that an officer should understand his pay list, you do not mean that he should sit down for days and write every word in it. He should be able to look at certain

columns and be able to put his fingers at once on what is wrong. If he knows that, he understands the situation, and he need not labour at clerical work. One question asked was, "How would you train young officers?" I suppose the only way to train them would be to put them through a practical course. That may be done locally by arrangement with the station paymaster or otherwise. That, of course, is a matter for authority. But I do not think there ought to be any difficulty in teaching young officers the principles of debit and credit and showing them how to put their fingers on the weak spots in the accounts. As to "amalgamation of accounts," that opens up a very large question. I think the speaker suggested what is called the consolidation of various emoluments. That, again, introduces points of principle which must be dealt with by a higher authority. You will find that Parliament votes so much for skill at arms. Well, that has to be accounted for. Therefore, you must have a separate entry for a dozen or a score of shooting rewards somewhere, at some time. There will always be those things. It would be extremely difficult, I should say, to consolidate pay to any extent without uprooting the principle which has been laid down, that the money shall be separately voted, item by item. I think that is all I can usefully say in reply to those who have kindly criticised my paper.

The CHAIRMAN (Sir Ralph H. Knox, K.C.B.):—I am sure we thank Captain Redway for affording us this opportunity for a discussion on this very interesting subject. It is a subject which I am not prepared to enlarge upon. I am afraid I might talk all day upon these various points. The fact is, as regards these portions of the accounts, they are in a sense intricate. But that does not arise from the intricacy of the accounts themselves, which, as Captain Redway has explained, can be mastered in a very short time. The complication arises from the system under which our Army is raised, a voluntary system, in which we have to offer inducements of all kinds to every man who thinks of joining the Service in order to induce him to enter and to stay in the Army. The result is that many items, constantly increasing in number, go to make up the pay of the Army, each one of which is given upon certain conditions. If we could come to a conclusion to get rid of all these conditions and take the power to compel every soldier to do just as we like and give him a lump sum, which was much the original system explained by Captain Redway as existing more than a century ago, the accounts would again be very simple; but unfortunately the tendency of the present day is to start new hares, new ideas, something new must be done. We must have not only the pay for the soldier, but we must have extra pay, additional pay, pay for length of service, pay according to age, and pay on re-enlistment. All these things must be given to the soldier under certain conditions. The charges for these can only be made in the accounts on the condition that every one of those stipulations is complied with; it is absolutely necessary therefore to have elaboration of accounts and of vouchers. I can assure those here that those gentlemen at the War Office who are engaged upon the examination of these accounts are the least of all consulted as to the invention of these various ideas; they come from above; they come from the man in the street; they come to satisfy public opinion in very many cases; but the desire of the War Office officials is to make these matters as simple as possible. They are always trying to secure a simple system, because they would get through their work much more quickly and easily. The War Office is not like a trades-union, the officials do not want to get more men there to do the work. They like to get through the work with as small a staff as possible. They are in favour of reducing the labour of examination and of the audit, the necessity for which is not created by

them, but is imposed by the law of Parliament, and is annually reviewed in detail by a Committee of the House of Commons. The conditions upon which every charge is made in those accounts have to be tested and verified. That is their duty. They are there to perform that duty. Officers of the Army say, "Oh, trust us!" But in matters of this kind the principle throughout the whole world is that no man is to be trusted. Every one must be held responsible for accounting for the money entrusted to him. He is not held responsible, his accountability does not exist unless he renders an account of what he has done, and shows as far as accounts and vouchers can show that he has complied with the instructions given to him. That is the principle upon which every account is examined, and upon which everybody is entrusted with money. I can quite understand that those who are not accustomed to dealing with books and accounts have been very restive in having to work out or check those elaborate charges that have been made, but, as I have said, the complications arise from the system which has been gradually developed; and I am afraid from what is being done now it is being made more intricate and more difficult. Within the last session I think four or five new rates of pay and new conditions of service have been introduced. Everyone of those involves new points that have to be watched by the officers who deal with them in the first instance. Then as a matter of audit it is necessary to see by test that generally those conditions have been complied with. One gentlemen has described the small objections that are raised and disallowances made; but steps have in recent years been taken to get rid of most of those small disallowances, and to place in the hands of the commanding officer a general power to settle all objections that may be raised affecting small sums of money in the strict examination of the accounts. It is not long since I was in the War Office, and I am sure the whole tendency of administration was in the direction of getting rid of those very rigid practices of former days. One thing that annoys officers more than anything else has been referred to by Colonel Smith, viz., objections raised a long time after the events have occurred. The case he quoted, however, occurred in India. That is a system which is simply abominable. All I can say is, that of recent years the endeavour of the War Office has been to establish and bring about as rapid an audit as possibly can be secured. There is an arrangement under which the paymaster now examines on the spot the company pay list before it is rendered to the War Office. When the account is rendered to the War Office, that portion which it is necessary to examine to secure the test of the accounts is audited within a month from the date at which the accounts come in. I believe, as Captain Redway has stated, that there never will be a very kindly feeling between an accountant and an auditor. It is the business of the auditor to pick holes in what has been done by the accountant; but that very operation, that very system, saves the man from himself, just as the fact of every check, although it may be irritating at the time, is intended to keep the man up to the mark, to secure that he does not get into a slack condition, but that he is smart and regular. If this is attained, a man is always safe, he is always easy in his mind, and he is presented with no temptations to go wrong. An audit of that kind, if satisfactorily carried out, is, I believe, the salvation of all those people who are subject to it. I am sorry there has been any apparent feeling shown by some who have spoken. I can assure those gentlemen that they are quite in error in thinking there is any feeling but the best on the part of the examiners at the War Office towards those with whom they have to deal. Instead of their being interested in doing anything which is disagreeable to officers, the contrary is the case, and whenever apparently hard measures have to be adopted I can assure them it is done with the greatest reluctance.

SUGGESTED IMPROVEMENTS IN MILITARY RIDING AND BREAKING.

By Captain M. HORACE HAYES, F.R.C.V.S. (late Captain, The Buffs).

Thursday, 15th May, 1902.
Major-General JOHN CECIL RUSSELL, Colonel, 12th Lancers,
Equerry to the King, in the Chair.

I HAVE to thank you very sincerely for the great honour you have done me by attending this lecture. Its subject, "Suggested Improvements in Military Riding and Breaking," is of the utmost importance to our country, especially because the practical acquaintance which stay-at-home Englishmen possess about horses is becoming less every year. Our young rustics are seized with a longing for town life, and consequently the vast majority of the recruits for the mounted branches of the Service know nothing about our friend the horse. The majority of our subalterns are in the same plight. Even in the case of those whose fathers are hunting-men, the groom as a rule occupies the same authoritative position in the stable as the cook does in the kitchen. Those who have the good fortune to be sent to India quickly make up the deficiencies of their equine education, because there they have to be their own stud grooms. Even our veterinary surgeons can obtain their diplomas without ever having been on the back of a horse, or ever having handled the "ribbons" in a trap. Their case is a hard one, owing to the fact that their colleges (or rather teaching schools) are not State-aided, except in Ireland. Every member of the Army Veterinary Department should be a horse doctor, and not merely an animal doctor, to adopt the German distinction between *Rossarzt* and *Thierarzt*. Although the number of good horsemen in England is diminishing, we have the one great consoling fact that immense progress has been made in the science of horse knowledge within the last 50 years; but unfortunately our military authorities have introduced few, if any, of these improvements into the Service. We do not appear to have grasped the fact that riding and breaking are sciences as well as arts, and demand for their acquisition careful study as well as assiduous practice. A horse is a

much more complicated machine than a rifle or a cannon, and yet musketry and gunnery are taught in the Army only by men who have undergone long courses of scientific training, but our riding-masters have no such qualification: in fact, many of them know nothing about riding or breaking outside of the manège and parade ground, and are ignorant even of the paces of the horse. The Cavalry Drill Book gives us a convincing proof of this fact, for it tell us, on page 104, that "as far as relates to the general action of the horse, the canter is the same as the gallop, whether it be the short collected step of the manège, or the extended pace of the charge; there is this difference, however, which distinguishes them, namely, that in the canter the horse's forehand is raised, his whole figure is collected and shortened, his neck bowed and his head drawn in, and he moves by the spring of his haunches." Such a view of equine mechanism may have been pardonable 30 years ago, but since then instantaneous photography has shown us that the canter is a pace of three-time, and the gallop one of four-time. Thus, if a horse canters with the off fore leading, the order of his steps will be: *First*, off fore; *second*, near fore and off hind; and *third*, near hind. At the gallop it would be: *First*, off fore; *second*, near fore; *third*, off hind; and *fourth*, near hind. In fact, the canter has nothing to say to "collection," and is a natural pace which any colt or filly at grass can execute.

Reference to the literature of the subject shows us that our English system of military riding was founded on the old French *haute école* methods, and that none of the French improvements made within the last 70 years have been utilised. Our adapters made a singular mistake with reference to *épaule en dedans*, which they rightly translated "shoulder in," but misconstrued it as meaning that the shoulder was turned in, with reference to the body of the horse, and not as regards the school. In fact, the French shoulder in (*épaule en dedans*) is the passage with the head turned towards the inside of the school, and is synonymous with the French *croupe au mur* (tail to the wall). In order for a horse to pass, for instance, to the left in a well-balanced manner, it is necessary for his head to be turned to the left, so that the neck muscle (*levator humeri*) which draws the right fore leg forward, may work to the best advantage, which it cannot do unless its attachment at the top of the head is widely separated from its attachment to the *humerus* (the bone that lies between the elbow and the shoulder-joint). If the head, as in our English shoulder in, is turned away from the direction in which the animal is proceeding, the horse's action will be more or less cramped. Besides, teaching a horse to move to one side with his head turned in the opposite direction, is simply giving him instruction in a *défense* which refusers and jibbers often employ, in order to defeat the wishes of their rider.

Apparently from ignorance of the paces of the horse, the directions for the passage are vague and incomplete. On page 65 of Cavalry Drill we are told that the pressure of the outward leg makes the horse cross his legs, but nothing is said as to the manner in which this pressure should be applied. To be effective, it should be intermittent, as we may see on pages 244, 245, and 451 of my book "Riding and Hunting." Thus, in the passage to the right, the rider should give the pressure with his drawn-back left foot at the moment the animal places his near fore on the ground; because at that instant the off hind is on the point of coming down, and the near hind can then be picked up and brought to the front without any pause. The rider can take the time of giving this indication better from a fore leg, than from a hind one, which is hidden from his view.

A knowledge of the paces of the horse teaches us that there are two forms of the rein back, namely, that in which a cart-horse tries to push a heavy load to the rear, and that of the saddle-horse. The former naturally throws his weight into the breeching and consequently raises his head, so as to make himself light in front and heavy behind. If the breeching were to suddenly break, he would, of course, tumble with his rump against the cart. The cart-horse style of rein back is the one adopted by our military authorities, for they tell us that in the rein back "each man will feel both reins lightly, by turning the little fingers towards the breast, and will press both legs to the horse's sides to raise his forehand and keep his haunches under him; the rider must not have a dead pull on the horse's mouth, and must ease the reins after every step, and feel them again." By these directions, the horse is made light in front, and consequently he is rendered heavy behind, when he is reining back! We are all agreed that when going forward, a horse should be light in front, and, to be consistent, we should admit that the reversed distribution of weight should take place in a retrograde movement. If a horse is heavy behind when he is reining back with a rider in the saddle, he will be unable to pick up his hind legs properly, and will be more or less inclined to rear. The well-collected rein back, as we may see in Barroil's *L'Art Équestre*, and Fillis's *Principes de Dressage et d'Équitation*, is a diagonal movement of two-time, and is effected by an alternate feeling of the two reins and by the alternate closing of the opposite legs. Also, the rider's weight should be brought somewhat forward, so as to enable the animal to pick up his hind legs freely. Here, the touch of the rider's leg makes the horse raise the hind limb of that side, which has been previously lightened by the head being turned to the opposite side. In this way, the rein back can be performed with such beautiful precision, that the rider can make his mount lead off with whichever diagonal he likes, and in perfect cadence. If, before the rein back, one fore leg is more advanced than the other

fore leg, when at the halt, the advanced fore leg and its opposite hind leg should, of course, be the diagonal to begin the movement to the rear.

With regard to bridling a horse, we read in Cavalry Drill, that "the bit should be placed in the mouth so that the mouth-piece is one inch above the lower tusk of a horse, and two inches above the corner tooth of a mare," but unfortunately the "why?" of the reader is not anticipated. Colonel Greenwood of the Guards, who is an excellent cavalry officer and a fine horseman, was, I believe, the first to combat this erroneous direction, about 40 years ago, by stating in his valuable book "Hints on Horsemanship" that the mouth-piece of the bit should be just clear of the tushes of the horse, and about one inch above the corner nippers of the mare, because the curb-chain would then have little or no tendency to work up on the sharp edges of the branches of the lower jaw. This position has the further advantage of placing the mouth-piece on that part of the jaw-bone which affords the broadest bearing surface, as I have pointed out in "Riding and Hunting" (page 104).

We are told in Cavalry Drill (page 105) that "a formed horse should be trained to be ridden on the bit entirely; but on first bitting, the bridoon is to be used in aid, and to bring him to the bit by degrees. Very light-mouthed horses may require to be ridden on all four reins on all occasions." I believe that the experience of the present South African war has taught our cavalry officers who have served in that campaign, that in the large majority of cases the bridoon is more useful than the bit. I was brought up in Ireland, with a deep reverence for the snaffle, and after a long absence from the Emerald Isle I was delighted to see, when hunting last winter with the East Galway hounds, that almost everyone out with my friend Mr. Pollok's pack used my favourite bit for both guidance and control. I am aware that English hunting etiquette demands the use of a double bridle, but I have learned from experience in Leicestershire that many accidents in the hunting field might have been averted had the victims trusted to a snaffle instead of a curb. In school work I have always found that it is easier to teach the average horse all the ordinary *airs de manège* with a snaffle than with a curb. I have seen a good deal of Continental and English school riding, but regret to say that I cannot speak from the experience of active service. This is not my fault, because when I went to South Africa last year in veterinary charge of remounts, on the first of two occasions I volunteered for active service as a veterinary surgeon, but the veterinary authorities out there refused my application, probably because they thought I knew too little or too much about horses for their requirements. I therefore leave the question of superiority between snaffle and curb to be decided by my military friends. No one is better qualified than our distinguished Chairman to settle that point from its military aspect.

As I have not lately had an opportunity of examining military bits, I refrain from criticising their construction. I wish only to repeat what I said in "Riding and Hunting," that the best curb for an average horse is one with a mouth-piece 5 inches wide; low (Melton) port; lower end of cheeks 3 inches long; length of upper end of cheeks from mouth-piece to top eye, 1⅞ to 1½ inches; and upper end of cheeks inclined a little outwards, so that the distance between them at the top may be about 6 inches. The Ward Union curb is made on somewhat similar lines, and is certainly the most generally useful curb on the market. In all cases the mouth-piece should be thick, so that it may not hurt the bars of the mouth.

In an admirable letter which appeared in last January's number of the JOURNAL of the United Service Institution, Major Dashwood has ably discussed the question of Pelhams. Although this form of bit should not be used with two reins, because the snaffle reins will tend to draw the mouth-piece too high up in the mouth for the proper action of the curb; it is useful with one rein, in which case the Pelham may be employed either as a snaffle or curb, as may be required.

Our military system of holding the reins in one hand is faulty, because the grip on them is obtained by the lateral pressure of the fingers and thumb, which lateral pressure is far weaker and much more tiring than the ordinary closure of the hand with the reins "crossed" in it.

On page 43 of Cavalry Drill, we read that when men are riding with a bridoon rein in each hand, "the turn is made by a double feeling of the inward rein, the outward retaining a steady feeling." This "double feeling" would have the effect of pulling the bridoon more or less through the horse's mouth, and would give him but a slight indication to turn. Both theory and practice teach us that the difference should be made in the direction of the respective reins, and not in their tension, during the turn. Thus, in turning to the right, we should carry the right hand to the right, so as to give our mount the clearest possible indication to turn to the right; and we should carry the left hand also to the right, so as to press the near rein against his neck, but without altering its tension in any way. The reverse indications would of course be used in turning to the left.

I approach the subject of spurs with great diffidence, because I do not know the amount of influence which "eye-wash" has on it in the Army. At a social function like a meet in the Shires, spurs are as much an article of propriety as a pair of gloves; but I question their use, except, perhaps, for doing the *piaffer*, making a horse canter on three legs, or some other high-school movement in a circus. I cannot recall a single instance in which they were any advantage to me between the flags, out hunting, or in a school, because their severity makes them

useless as an ordinary indication. The late George Fordham, whom I had the pleasure of knowing when I lived in Newmarket nearly twenty years ago, thought little of them, and told me that they made a horse shorten his stride and "shut up," instead of bravely struggling home. We have the fact that sharp spurs are forbidden at polo, except by special permission. I believe that Lord Harrington, who is a fine horseman, has advocated their abolition in the Yeomanry.

If there is no social degradation even in Leicestershire to hunting men on account of putting their feet home in the stirrups, why should this safe and comfortable procedure be tabooed among cavalrymen?

Throughout the Cavalry Book the expression "a stronger feeling of the outward leg" frequently occurs; but when we are sitting straight on a horse, it is impossible for us to press one leg stronger than the other leg. What we should really do is to exert pressure by drawing back the outward leg a little.

Our military "aids" are limited to the action of the hands and legs. It would be a great advantage if the weight of the body and the voice were added to their number. In turning, especially when the change of direction is made sharply at the gallop or fast canter, the weight of the rider's body ought to be inclined inwards, which is a practical as well as a mathematical fact, that no good horseman ought to ignore. The necessity of doing this I would be glad to illustrate by means of instantaneous photography, but the limits of time and the generous patience of my hearers will not admit of such elaboration at present. Having accustomed a horse to the change in the distribution of weight at the turn, we can easily teach him to obey it as an indication ("aid"), both at the turn and for the change of the leading fore leg in the canter and gallop. Although the advantage of being able to make a horse readily do this change is passed over in silence by the writers of Cavalry Drill, it is well recognised by polo players and Continental school riders. If, for instance, our horse is leading with the off fore and we wish to turn him to the left, it is essential for him to change his leg, in order to make the turn with the near fore leading, because if he does not do so, he will be liable to cross his legs and come down, to say nothing of the disadvantage of the turn being made in an uncollected and clumsy manner. The change in the distribution of weight can also be made with benefit for the halt by bringing the weight back.

The question of using the voice as an "aid" is so fully dealt with in the new edition of Captain Miller's book "Modern Polo," which has just been published and which I had the pleasure of editing, that I need not dwell upon it here. We all know that horses quickly learn to obey words of command, which, in the case I refer to, can be uttered in a very low tone of voice, because a horse's power of hearing is singularly acute.

For practical purposes, they might be restricted to a click of the tongue for starting, "whoa!" for the halt, and "steady." We should here bear in mind that horses have little power of discrimination between mere words, but are particularly observant of the tone of the human voice. Even if such verbal orders were unsuitable for school and parade work, they would be of immense use on active service.

I mark with surprise that Cavalry Drill contains no directions for either making or teaching a horse to turn on his forehand, which is a very necessary movement for mounted men who are acting singly, as, for instance, when opening a gate, or for placing their animal alongside some object.

On going through the Cavalry Drill-book, I was also greatly surprised to find that our cavalrymen are not taught how to do the figure of 8 at a canter, so as to teach them and their horses how to change the leading leg at the canter, and do the turns to the left and to the right collectedly.

After reading the directions for "training the young horse," Cavalry Drill (pages 96 to 101), we need not wonder that in South Africa complaints were made that many of the imported remounts were unbroken. The system laid down in the red volume does moderately well for the civilised horses that are purchased as remounts in this country, but it is of little use with animals which are brought up in a semi-wild state, especially if the breaker is in a hurry. I became greatly impressed with this fact when I was a subaltern in India in F 19 and D 20, Royal Artillery; for our difficult Australian remounts were used only as "off" horses in the teams, and were never ridden. As I concluded that breaking was an art about which we knew very little, I determined to study it, and having acquired a certain acquaintance with it I resolved to teach breaking in various countries, so that I might acquire all the knowledge I could from my pupils. The French proverb truly says that one may know more than anyone else, but it is impossible for one to know more than all the rest. The result of my experience in breaking is that horses, before they are ridden, should be made quiet to carry a weight on their backs, and should be taught to obey the indications of the reins. In short, we ought to make a horse ridable before getting on his back. Memory is a horse's strongest mental faculty, and consequently the more he is prevented from "playing up" during the process of breaking, the quieter will he subsequently be. The preparatory mouthing lessons had best be given according to the long-rein system which I have devised. By it, perfect control is obtained, and any unbroken animal can be taught to circle, turn, halt, rein back, and jump in a well-collected manner in three days, during which time he can be gradually accustomed to carry weight on his back, by attaching, for instance, bags of earth or shot to the driving pad. This work could be

varied with advantage by teaching him to turn on his forehand and also on his hindquarters by means of a cutting whip or cane, according to the French method (see Fillis's and Barroil's books). In this way and with two or three auxiliary methods, which time does not allow me to describe, I never had any difficulty in breaking, within four or five days, wild horses of the steppes of the Don and Volga, when I was employed at the Russian remount depôts by the Russian Minister of War. These animals are far more difficult to handle than unbroken South African horses, of which I had a year's experience during a breaking tour among the Boers in the early nineties. The great interest which the Boers took in the breaking and handling of horses showed me that they were far more formidable enemies than the English public gave them credit for being. It makes me very sad to contrast their horse knowledge with that of the cavalrymen with whom I went out to South Africa in a Government transport.

I think we all will admit that every cavalry horse should be taught to lie down, which can be quickly done by the American method of tying up one fore leg and drawing the head by a cord to the opposite side. This plan has the immense advantage of "taking the nonsense" out of unruly horses; and had it been practised on unbroken remounts in South Africa, the tears of many widows and mothers might have been spared.

I cannot too strongly urge the necessity of abolishing the present faulty method of lunging young horses which is recommended in Cavalry Drill. By it the horse is made to move in a thoroughly uncollected manner, for no means are taken to prevent his hindquarters from swinging outwards. In fact, instead of his hind feet going on the same track as his fore feet, they describe a concentric circle outside of it. Also, the single lunging rein affords no means of controlling the paces of the animal, which can walk, trot, or canter just as he likes, unless he is forcibly stopped. By the long-rein method he is under absolute control in all his paces, and he is mouthed as well as exercised. If he is high-spirited, the fact of his being able to career around the lunging circle at his own sweet will is the worst possible lesson he can get. In circling a horse with the long reins, the outward rein, which goes round the animal's quarters, acts like the outward leg of a capable rider. In speaking of the long reins, I am, of course, aware that they have been in use for the last hundred years for breaking horses, but in a different way from the method I have devised, which certainly owes a great part of its efficiency to the presence of the standing martingale buckled on to the rings of the snaffle, the use of which was taught me by Mr. John Hubert Moore, who is the father of my friend Mr. Willie Moore, of steeplechasing fame. Its help reduces the difficulty of breaking in young horses by at least one half.

It is a fact which cannot be denied, that many lives, especially those of inexperienced youths, have been lost in South Africa on account of these poor victims to ignorance having been put on badly broken horses, which certainly formed the majority of the remounts. Such occurrences should be avoided in future by the institution of special courses of study in horse-breaking, and if I were permitted to lend a helping hand I would only be too glad to work in that direction for the welfare of our country. As no change in our methods of military horse-breaking has taken place since the battle of Waterloo, I do not think that even the sad experiences of the South African campaign will have any effect on our Conservative authorities. Practical horsemen, like those whom I have now the honour to address, will recognise the all-important fact that in olden times our military horse supply consisted of home-bred animals which were easy to break in; but in future it will be more or less made up of wild horses, and consequently the difficulty in breaking will be greatly increased. Luckily Colonials are now members of our Empire; and as they are not so self-satisfied as stay-at-home Englishmen, I hope, before the year is out, to be among my Australian horse-loving friends, who no doubt will teach me much more than I can show them.

Major E. C. HAWKSHAW (late R.A.):—We have listened with much pleasure to Captain Hayes's lecture, a gentleman well known to all of us, though I never had the pleasure of meeting him before personally. Having been in India, I know him well by name. Regarding the training of Army horses, one thing must always be taught non-commissioned officers and men, and that is sympathy with a horse; another that a horse must be brought to regard man as his friend. So many young fellows harbour the idea that a horse to be broken in must be broken in spirit, to which too often follow knees and hocks. A cut with a whip is the introduction of the tutor to his pupil, and the latter is dubbed a brute because he naturally resents it with a kick. You can no more treat two horses alike than you can two men or two women. With a sensitive well-bred horse the voice will do all frequently, whereas one cut will permanently spoil everything. It is a well-known fact that, with the exception of an elephant, no animal has a more retentive memory than our noble friend the horse. I was delighted to hear Captain Hayes dilate on turning a horse and pulling his mouth about. This is a *most* important point. What is the use of a man thinking that he can pit his strength against that of a large animal like the one in question? The horse must be taught by touch what is required of him. A polo pony kindly treated will, after a few games, follow the ball like a cat does a mouse. Look at gun horses. I have served for a long time in the Horse Artillery and other branches of the Royal Artillery and personally took great interest in driving in teams, and found that a halt from a fast gallop was mostly to be effected with the voice. Getting a riding horse to throw off with right or left foot in cantering is all done by handling gently and pressure of legs. No hard-spurring or knocking about need ever be resorted to. In Arabia the horse is a cherished member of the family. Everything is done by a sign. Topmost speed is mostly produced by the rider bending forward and pinching the horse's ear. Young horses must be treated like children, and not over-worked

or over-strained with carrying too much weight until their bones are hardened and thoroughly formed. If this is neglected the result is curbs, spavins, and all the other ills which horse-flesh is heir to. This and the non-rasping of hoofs is the secret of keeping a horse's legs right. The Almighty put the enamel on the hoof to keep the oil from escaping. Too often man thinks he knows better, rasps it off, the result being bad feet, navicular, splints, etc. Shipping and training requires especial attention. Never fight a horse until you are obliged to do so. Try and gain your object by the exercise of man's superior intelligence. How often have we seen blind-folding resorted to at once! When taking horses on board a ship select a steady one to lead, make the man turn his face away from him, and go unhesitatingly on as if nothing unusual is occurring. If any horse in following begins to fight, don't bother with him, but lead him on one side and let him see all his friends disappearing on board. In nine cases out of ten at last he will follow too. I once got a horse on board at Portsmouth that baffled his battery for an hour, not to mention the bluejackets too. They had fought him from the outset and tried the fatal blind-folding, until the animal was mad with terror. The plan is my own, and I recommend its use in bad cases. Wrap a thick cloth completely round the girth and back to prevent his being galled; then put a rope round on top of the cloth with a long end on each side (a canvas band is better, as there is less chance of cutting). Put four or more men on each rope, and let one man steer his head without pulling at him unnecessarily. All being ready, walk away with him. He is then bound to go, and can see where he is putting his feet. The old plan of a rope round the quarters is much to be deprecated, as it too frequently happens that a horse's hind legs are pulled under him, he sits suddenly down, and is liable to injury by breaking his back. Never pull with great force at a horse's head from the front; nothing is easier than to break his neck in this way. In old days barbarity was practised in cropping ears and tails, and using hot irons for the most trivial mishaps. Thank goodness we eschew these things now to a great extent. When commanding batteries in India I advocated not cutting horses' tails at all—considering it a great shame to deprive the animal of what had been given him for his own protection against flies in the great heat—but it was not considered smart, so common-sense went to the wall, and horse-sickness took its place, as has been our fatal error in South Africa. Turning their tails to the wind when standing in the camp is also a *most* important comfort to them, that is in high winds or storms. Before officers are allowed to be considered efficient in the mounted branches of the Army they should be compelled to systematically learn from the outset stable management, and the *common-sense* care of animals according to their natural state. It too frequently is assumed that, because a young fellow can sit on a horse with a military seat, he is fit to go and buy, train, or have charge of horses. Our failings in the recent war are nothing more than what one has wept over for years, and received on many occasions reprimands for bringing forward in reports. This, of course, is due to the senior officers never having studied the absolute nature of our charges.

Lieut.-Colonel F. N. MAUDE, *p.s.c.* (late R.E., O.C. 1st Hants R.E. (Vols.)):—I should like to thank Captain Hayes for his very interesting lecture; I only regret that I came in so late that I had not time to criticise it as it deserves. The author in his last paragraph says:—"It is a fact which cannot be denied, that many lives, especially those of inexperienced youths, had been lost in South Africa," and so on. I would go further than that and say it is a fact that this war has been going on for two years longer than it need had done, because, as Captain Hayes very rightly says, we have absolutely neglected since the time of Waterloo the A B C of training men to take

care of their horses and to ride them. One can only deal with rough approximations in a discussion like this, but think what the difference in this war would have been if, instead of the extraordinary lot of broken-down horses we had up at the front at the time of the Modder River, General French had had horses in condition, ridden by men who knew how to ride them, and how it would have shortened the time we required to reach Pretoria. I think Captain Hayes will agree with me in this: that with any given horse a first-class horseman will take that horse at least three times as far as a bad rider. That is an extreme case. But supposing horsemanship had been mastered, as it should have been, in the Army when the war broke out, I maintain that although we should have lost many horses—of course the conditions were against us—we would, nevertheless, have managed to cover treble the distance in a day's march that we often did, and with no greater loss. What that would have meant at the time when we were at Pretoria we all know. The point is this: if, as Captain Hayes tells us—and it is within my own experience—there has been no change in the methods for many years, and very little improvement, is there no way in which we can get the authorities to devote more attention and time to the question of horse training? I am afraid that the authorities can only do what the spirit and will of the Army enable them to do. It is no good giving orders that we are to do this, that, and the other with regard to the training of men or horses when you cannot make a man use his brain unless he chooses—and if men will not use their brains, the more you drill them the worse they get. We shall never get any great result until we have made it worth every man's while in the cavalry to give his whole attention and mind to what he is doing, and to take a pride in the care of his horse. That is the whole secret of the marvellous efficiency of both the Austrian and Prussian cavalries. It is difficult to say which is the better. Those men have their horses absolutely under control. It is not a mere case of circus back-riding to which routine has accustomed the horses, but the horse is absolutely at the rider's control, and is taken, placed by the rider exactly where the rider wishes him to be. The material with which they have to work is certainly not equal to ours. The late Colonel Percy Barrow some years before he died used to ride down with me at Aldershot to see some experiments made on the ordinary German system with English horses and English recruits—with shockingly bad horses and recruits. They were the drivers of the Royal Engineer troops, and were, as a rule, the men who had been rejected by every other corps in the Army. Yet, within six weeks, following the simple rules which the Germans had arrived at, not by orders from head-quarters, but by experiments and the survival of the fittest, we could get these men and horses to do what formerly we had taken six months to accomplish. General French thoroughly adopted the Prussian system which Colonel Barrow had introduced, and his regiment, the 19th Hussars, when I was attached to it in 1891, was about the best that could be seen anywhere. The horses were marvellously in hand, they would go anywhere at any pace, and were at all times thoroughly in hand. This success was due, I take it, to the very simple reason that every squadron commander, and every officer, was responsible for his own squadron or division. We are always hearing our cavalry officers abused because they go racing and take no interest in their work. But if a man is kept in barracks and there is nothing in which he may take a personal interest, he will endeavour to get out of barracks as soon as he can. If you give a man sufficient interest in his work and make him take a pride in doing that work, you will very soon see that he gives his mind and attention to it and takes a personal pride in turning out the smartest horses and the smartest cavalry in the place. Just look at the emulation that exists in the Navy. There can be no doubt of the extraordinary efficiency of the men; they take such a pride in their work that they devote their time solely to it.

Why cannot we do the same thing? It seems to me it is simply a matter of understanding what decentralisation means. We have got everything on paper which gives us decentralisation; all we want is the spirit to carry it out, but this must grow from the root upwards. You cannot create it from the top of the tree downwards. The most authorities can do is to create the conditions which will foster its growth—essentially a matter for sound common-sense and a knowledge of human nature.

Captain HAYES, in reply, said:—I have certainly obtained the wish of my heart to-day, and that was to learn something. I always want to learn things. I have learnt several very valuable hints from the gentlemen who have spoken to-day, and I thoroughly agree with them. If ever at any time I can be of any help to them in working out any scheme in regard to the breaking or school life of a horse, I shall only be too delighted to place my services at their disposal.

The CHAIRMAN (Major-General John Cecil Russell): — We have had a most interesting lecture from Captain Hayes. He has favoured us with a paper on very important subjects, and especially on the actual theory of the movements of horses when they are engaged in certain exercises. Every word he has said is most valuable, because he is an expert in the whole matter. He is a veterinary surgeon of the very highest attainments. He says truly that we must be not only theorists—and he advises us to be that if possible—but that we should know practically the formation of a horse as well as know how to ride it. With great deference to Captain Hayes, I must say that I think his criticism of the Cavalry Drill-book and our system of cavalry equitation is a little severe. Our system of breaking horses is no doubt faulty in a great many ways—it may be very faulty—but, at the same time, as I have had the honour of commanding a cavalry regiment myself, and have seen a great many cavalry regiments and batteries of artillery, both horse and field, I may be allowed to say that, although our theory may be extremely incorrect and our instruction very faulty in many ways, I cannot help thinking that the result has been very fairly satisfactory. Most of us, altogether irrespective of our personal attendance on many dusty field days in different parts of the world, have seen our military horses do exactly what was wanted in a satisfactory way on very many other occasions. Most of you have seen the beautiful exhibition of horsemanship and breaking in of horses at the Agricultural Hall at the Military Tournaments. These horses may have been trained in a very bad way, but I think you must all say the result is extremely good. I remember particularly the case two or three years ago of a horse artillery battery. I think it was commanded by Major Dunlop—which had only been formed within a very few months—one of the youngest horse artillery batteries—yet I saw that battery performing the most extraordinary double drive with the guns that I ever saw in my life. It was most beautifully done. Major Dunlop and his non-commissioned officers and drivers and everybody connected with the battery most certainly and thoroughly understood how to get the required result. Whether they went by the Drill-book or not I do not know, but certainly the result was there. If they went upon the theories which had been inculcated in all of us, I do not think the theories could have been very far wrong. No doubt they are faulty like everything else that is human, and undoubtedly they may be very greatly improved, and if we are to improve them I do not think we can do better than go upon the principles which have been so clearly enunciated by Captain Hayes. There are one or two points which he emphasised on which perhaps I may be permitted to say that I entirely agree with him, and I speak from experience gained when I had the honour of being at the head of the riding establishment at Canterbury, where we did a good deal of horse breaking. Captain Hayes mentions

particularly the position of the bit in the horse's mouth. Undoubtedly in the instructions I think the bar of the bit is too high, and, as Captain Hayes has said, it should be placed a little lower down than it is usually fitted. Captain Hayes's views in regard to the holding of the reins are, I think, extremely sound, if I may venture humbly to give my opinion. I have certainly found a difficulty myself in riding with the reins in the manner in which we are taught, and if everybody had their reins folded over as he suggested it would be a great advantage in many ways. Captain Hayes has criticised very justly the conditions of the breaking in of the remounts which were provided for the war in South Africa, and he pointed out how they ought to have been very much better trained before they took the field. There is no doubt whatever that we have something still to learn about the breaking in of horses, but in South Africa unfortunately there was no time allowed even for the most elementary breaking. The horses were landed from the ships, they were put into trains, and sent up to the front: the men were chucked on to them, and they had to do what training they could actually in the field. There was really no time whatever for any training—good, bad, or indifferent. Finally, there is one point I should like to notice, namely, that Captain Hayes says that "In olden times our military horse supply consisted of home-bred animals which were easy to break in: but in future it will be more or less made up of wild horses, and consequently the difficulty in breaking will be greatly increased." There is no doubt that in the days of the Peninsula and in our campaigns in Europe in the early part of the last century we had a very admirable source of horse supply in this country. In those days people made their journeys on horseback, or in post-chaises, and for that purpose a very excellent breed of horses was reared in the country. The horses were bred for a particular purpose: they were bred to have strong constitutions, to have good staying powers, and to have sound, hard legs, and we succeeded in producing that type of horse which I am sorry to say does not, I believe, exist in any number in the country at the present moment. But in the days of the Peninsula there is no doubt that our cavalry and our artillery were extremely well mounted on that type of horse, and excellent results were obtained from it. It would be very much to the advantage of the country if we could by some means, by the efforts of horse-breeding societies, or by Government intervention, try to reproduce in some sense the class of horse which furnished so many horses for our wars in the early part of last century. Captain Hayes has said that our supply in future will be more or less made up of wild horses. That is all very well. We have had the command of the seas during the South African war, and we have been able to put horses into South Africa from every quarter of the world. If we had been at war with even a second or third rate sea Power, the whole of the supply of those horses would have been checked at once, and until our Navy had absolutely cleared the seas we should not have been able to move cargoes of horses as we hitherto have done; and if we were at war in Europe we should have to be entirely dependent on our own horses until we had actually got command of the seas. I think it is a very foolish thing indeed, if I may be permitted to say so, if we are going to consider that we shall always be able to import horses, even from our own Colonies, to any seat of war where we may be engaged in military operations. By all means let us be prepared to break wild horses from whatever part of the world they may be able to come, but we ought if possible to have a sufficient supply of horses at home to at any rate supply our wants until we can have command of the seas. I have taken up too much time already, and I shall not venture to say anything more, but I hope I may be allowed in the name of all of you to offer our most cordial and sincere thanks to Captain Hayes for his very admirable lecture, and for drawing our attention to so many points which are of the greatest importance if we

want to have effective mounted troops. We have always fancied that we were a very horsey nation, and I am afraid in this respect we have been disappointed by recent experience, I will not say in the Regular troops of the Empire, because they have done well, but we found there was a great want of knowledge in the general population of the country, both in regard to the riding of horses and looking after them, and everything connected with them. I can only hope that those people who are so very ignorant of the subject will take an opportunity of studying the admirable literature which is composed in the books written by Captain Hayes. In the meantime, I venture to offer to their author our very hearty thanks.

THE VON LÖBELL ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS IN 1901.

Précis by Lieut.-Colonel E. GUNTER, p.s.c. (late East Lancashire Regt.)

PREFACE.

The XXVIII. Volume of the above publication for 1901 contains 541 pages, less by nearly 100 pages than that for the previous year, the notices of the Boer War in South Africa being omitted, as explained below.

Before giving any account of the contents of this volume, the author in his Preface pays a warm tribute to the honoured name of the founder of this publication, Colonel VON LÖBELL, who for many years conducted it, and who died on the 18th October, 1901, near Berlin, at the ripe old age of 85. The Report will however still bear his name. "When, owing to increasing years, he laid down his pen, it might well be with the conviction that his creation had won a foremost place in German military literature, and had indeed come to be recognised as a work of international importance. His upright character, his correct judgment of men and things, and his amiable kindly manners, won for him many friends among the numerous contributors to his military publications. We, his successors, shall best honour his memory by striving to maintain the work at the height to which he raised it, so that it may attain by degrees to even greater perfection, and thus remain a worthy monument to his creative genius."

The Editor has also to deplore the loss of two faithful collaborators, Colonel PANZERHJELM, director of the War-School in Sweden, and of Colonel VON GERNETH, of the Bohemian Army, who was the writer of the Report on the Boxer Rebellion in China in last year's volume.

In the present volume the political situation in Central Asia has been especially considered, as in Part I. full reports are given of the Anglo-Indian Army and of the Afghan and Persian Armies. A Report is also given of the United States Army which will be continued each alternated year by year with that of Japan. This necessitated condensing the accounts of the Forces of the smaller European States, and detailed information regarding these will only be given in future every other year.

The considerable increase in the strength of Armies having increased the importance of Communications, Train, etc., a knowledge of the organisation and working of these is indispensable to every educated soldier. The Editor intended adding a special Report on this to the present volume, but at the last moment difficulties prevented this idea being carried out; it will be however, done next year.

The Editor decided that the Report of the Boer War in S. Africa should be discontinued, as the accounts received were meagre and inexact, and the events of the war and its conduct were of but little military interest. They however reserve to themselves the right of concluding the account of this war at a suitable time.

As but few changes of any importance have been made in Part I., ORGANISATION, etc., the translator has curtailed this to give room for the Report on Artillery Progress, Literature, etc.

The English equivalent Garrison Artillery is used in preference to *Fort* Artillery.

For brevity, notes by the Translator are simply marked with his initials.—E. G.

PART I.—ORGANISATION.

AUSTRIA-HUNGARY.

The re-organisation of the Imperial Landwehr, commenced in 1898, is almost completed. It consists of 36 Landwehr Infantry Rifle Regiments and 2 Landesschützen (Frontier Guard Regiments in the Innsbruck Division) distributed among the 9 Landwehr Districts which form Divisions in war. They have all 3 Battalions, excepting that of Zara, which has 4. Total, 115 Landwehr Battalions. 4 Brigade Commands for these Landwehr were formed in Olmütz, Laibach, Jaroslav, and Linz. The Standing Army consists of 15 Army Corps each in its own Territorial District of 2 Divisions. Total, 31 Infantry Divisions and 5 Cavalry Divisions, with Artillery, Engineers, etc., in proportion of the same strength as published in the JOURNAL for November, 1900, p. 1294.

New provisional Infantry Drill and Training Regulations were issued on 1st October, 1901. The gymnastic exercises are cut out, as they are to be issued in a separate volume.

Imperial Manœuvres, which the Emperor personally attended, were held in September in South-Western Hungary, and the passage ot the River Drau formed part of the exercises.

Field-firing on a large scale was carried out by the 5th Corps (Head-Quarters, Pressburg) near Veszprim in Hungary, at which experimental practice with some new Q.F. field guns and howitzers was also carried on, aided by observations from war (captive) balloons.

France.

The territorial regions Army Corps stations and strengths remain almost the same as in 1899.*

The Colonial Army is approaching the strength laid down in the order of the 7th July, 1900 (viz., 3 Infantry Divisions, 6 Brigades of 12 Regiments of 36 Battalions of 144 companies), 1 Field Artillery Brigade of 3 Regiments (12 Field Batteries), and 6 Mountain Batteries and 18 Batteries of Garrison Artillery.

By the decree of the 31st May, 1901, a number of Batteries are permanently attached in peace to Infantry Divisions, the commanders of which have, as a rule, 6 Field Batteries under them. The General Officer Commanding the Artillery of the Corps the Divisions belong to has, as heretofore, the superintendence of their technical training and their shooting practice. This partition of these Batteries among the Divisions was carried out by the 1st August, 1901, excepting in the 9th, 14th, 15th, and 19th Army Corps which were not completed. It had not yet been quite decided what the eventful organisation is to be, but proposals are to be made according to which (the *Military Journal* says) 1 Regiment (4 Batteries) will remain with each Corps as Corps Artillery besides those attached to Divisions, and the number of guns in a battery is to be reduced to 4. But it is not intended to lessen the number of guns in an Army Corps, as it is expected that 200 new Batteries will be formed.

The Engineers have been increased. Of the 7 Regiments of Engineers 5 have 4 Battalions, 2 have 3. The number of companies in each Battalion varies. One has 7, two have 6, one has 5, eleven have 4, and eleven have 3 companies.

Enlistment, etc.—According to newspaper reports, a project has been laid before the Chamber of Deputies, which will considerably alter the terms of service. As a principle, 2 years' personal service with the colours is required of every able-bodied youth. Upon this follows 11 years' service in the Reserve, and this is succeeded by 12 years in the Territorial Army.

Recruits who voluntarily offer themselves for enlistment must have completed their eighteenth year of age.**

The minimum height has hitherto been 5 feet. On 2nd April, however, a ministerial decree lays down that, if otherwise fit for service, a recruit is not to be rejected for not reaching this standard. This will, it is hoped, increase this year's contingent of recruits by 12,000 men.

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* See Report for that year published in the JOURNAL for November, 1900, p. 1299.—E. G.

** An interesting account of the training of the French soldier and other details will be found in the JOURNAL for July, 1902, p. 961.—E. G.

The French Colonial Forces.—On 7th January, 1901, the law regulating the Colonial Forces took effect.

There are in the interior 3 Divisions, each of 2 Brigades, each of 2 Regiments, each of 3 Battalions, each of 4 companies and a *cadre complémentaire*, from which latter a fourth Battalion can be formed in emergency. The strength of the companies is 3 officers and 121 men.

There are 5 Regiments permanently stationed in the Colonies—3 in Indo-China and 2 in Madagascar.

2 Battalions are in West Africa, 2 in New Caledonia and Martinique, 1 Battalion (of 2 companies only) in French Guiana, and 1 (2 companies) in Guadaloupe. 1 company in Tahiti.

The Native Colonial troops are:—

1 Regiment (3 Battalions) of Annamite Rifles in Cochin-China.

3 Regiments, 2 of 3 Battalions, 1 of 4 Battalions of Senegal Rifles in the Soudan, Senegal, and Madagascar.

4 Battalions of Senegal Rifles in various stations.

These troops can all be brigaded when required, the Staffs being complete.

The Colonial Artillery of the interior is formed into 3 permanent Regiments, each of 4 Field, 2 Mountain, and 6 Garrison Batteries, and in 5 companies of labourers and 1 of artificers.

In Tonkin there is 1 Artillery Regiment of 2 Field, 4 Mountain, and 2 Garrison Batteries.

In Cochin-China there is 1 Artillery Regiment of 2 Field, 2 Mountain, and 2 Garrison Batteries.

In West Africa there are 6 Mountain and 9 Garrison Batteries.

The Colonial Troops in France are formed into a corps of 3 Divisions under General Duchesne. The 3rd Division is not yet formed. It will be with the headquarters of the Corps in Paris. The other 2 Divisions of 2 Brigades each are at Brest, Cherbourg, Toulon, and Rochefort.

Recruits for the Colonial Army join in November.

New Regulations, Manœuvres, etc. — New Regulations for Field Exercises and Manœuvres, etc., were issued to several Regiments for trial. They are up to modern tactical requirements and state that preparation for war is the sole object of all peace training. In the autumn new provisional regulations for Artillery training were issued, which are necessitated by the introduction of the 75-millimetre Q.F. field gun. The Report speaks well of both these books.

The Autumn Manœuvres, in the presence of the Tsar, gave great satisfaction. The transport of the troops to these by rail was considered a triumph of railway administration. 190 troop-trains were sent off from

4 stations, carrying the troops back to their quarters in 15 hours without disturbing the ordinary traffic.

In June, practice in guarding a railway line was carried out in the departments of Cher and Loire et Cher, the Reservists of the Territorial Army being called out for this purpose and grouped along the line. They were allowed to wear plain clothes, but armed with the 1874 rifle.

Experiments with modern heavy guns with mélinite shell against the old armour-plated forts on the Meuse showed that the latter were not in condition to stand a siege. In October, near Lyons, experimental practice with stretcher bearers was carried out to see how quickly the wounded could be got away from a battle-field and attended to. Practical exercises in sanitary service were also carried out at Paris, Châlons, Rennes, and Clermont-Ferrand.

Exercises in *Supply* were also practised at Châlons and Rheims, corn being purchased, the magazines filled, etc. These were of great use in enabling the civil as well as the supply authorities to judge how they should best act in war.

Military Education.—From 1903 the age of officers going up for the St. Cyr examination is reduced from 21 to 20, with a minimum of 17, as it is considered desirable that the bulk of officers should be younger than at present.

GERMANY.

The general strength of the German Army having been tabulated in brief last year there is no need to repeat them, nor, as stated in the notes to the Preface, will our space admit of tables to the exclusion of other matter.

Five squadrons of Mounted Rifles were formed during the year from men and trained horses selected from Cavalry Regiments.

Five Machine Gun detachments, each of 3 officers, 66 non-commissioned officers and men, were permanently attached to the Guard, and 1st, 2nd, 4th, and 10th Rifle Battalions.

A Board of Medical Advisers, with the Director-General as President, a Vice-President, and 15 members, was constituted to deal with medical and sanitary business.

In Bavaria 3 new Brigade Divisions (6 Field Batteries) were formed from existing Field Batteries and other corps. These now form part of the Divisional Commands. Another company was added to the train, being formed from men of existing Battalions. A Telegraph Company, with a Cavalry Telegraph School was formed from existing Field Engineer Battalions and from the Railway Battalion.

In Saxony 2 new Brigade Divisions (6 Field Batteries) were formed.

The price for remount horses has been raised to £45.

The Report gives a list of the different courses held at the School of Musketry at Spandau-Ruhleben with dates, showing that these are carried on from March to November, that General Officers attend a special course, and all field officers as well as lieutenants and captains, have to attend courses lasting a month. Selected non-commissioned officers also attend, and a special short course for cadets was held in September.

The details of the new Cavalry Telegraph School are also given.

Imperial Manœuvres were held in West Prussia in September, 1901.*

Great Britain.

The Report devotes a good deal of space to the British Army, and gives tabular statements showing the total strengths. It mentions the great departure of Mr. Brodrick in forming Army Corps, but says that even the first three exist on paper only. It estimates for a war beyond seas the following available numbers, besides troops that could be temporarily withdrawn from India, as they were during the Boer War, and Colonial troops:—

	Men.
3 Cavalry Brigades	7,491
3 Army Corps	108,777
Line of Communications	4,000
Total	120,268

But it allows that these numbers could be considerably increased by the addition of Militia and Volunteers offering their services abroad. It reckons the total force for war within the United Kingdom as under:—

	Men.
A Field Army of 6 Army Corps	260,000
Home Garrisons	196,000
Volunteers for Defence of London	100,000
Total	556,000
Unavailable, Invalided, Sick, Untrained Men, etc.	120,000
Total, about	680,000

The Report notices all the recent changes, especially the formation of a new Colonial Volunteer Corps, with Mounted Infantry, Cyclists, etc., to be raised from Colonists residing in London for the time, and of the "Imperial Yeomanry." It describes the Army Corps system, which,

* A very brief account of these Manœuvres was given in the JOURNAL for May, 1902, p. 716.—E. G.

though the Army Bill passed both Houses of Parliament, is considered by many, it says, hardly likely to be carried out. It mentions the new organisation of the Militia Reserve, and details the arrangements for training the Volunteer Battalions specially selected to take their places in the Army Corps. It gives details of the War Office and Army Medical Corps re-organisation, as well as that of the Artillery, and goes minutely into the recruiting question in Great Britain.

The Report notices the great efforts being made in England to make the training of their men by the officers a real preparation for war, and the abolition of all useless parade movements and mere show.

The writer criticises unfavourably the present state of discipline of the British Army, which, it says, was never very high.* In Aldershot and Shorncliffe murders and military riots on a large scale took place. Conflicts between bodies of troops and attacks upon officers, with not only the *arme blanche* but with ball cartridge, took place, and in October the open insubordination of Yeomanry in regard to their pay, and their disobedience to their officers, were reported and commented on in the press.** This shows how much the spirit of insubordination had increased in the new levies. The authorities only dealt with the most flagrant cases of insubordination by awarding terms of imprisonment of one or two years. The desertion from the Army amounted to 8 per cent. as against 6 per cent. of former years, while that from the Militia reached to 9½ per cent.

The dismissal from their posts of Sir Henry Colvile and Sir Redvers Buller is commented upon.

The trials of motor cars and heavy road engines are mentioned, and the reports of Colonel Templer on the war experiments with balloons are briefly mentioned, as also the boat and raft practice at Wouldham on the Medway.

HOLLAND.

The Report gives the war strength of the Netherlands Home Army as under*** :—

—	Field Army.									
	Infantry.			Cavalry.		Fd. Artillery.			H. Art	Engrs.
	Rgts.	Bns.	Cos.	Rgts.	Sqdns	Rgts.	BrDiv	Batt.	Batt.	F. Co.
3 Infantry Divisions... ...	9	36	144	3	15	3	6	18	2	3

* The Boer War and other recent campaigns show that the discipline of the British soldier is of a high standard.—E. G.

** It would be interesting to know what papers the writer gathered this information from.—E. G.

*** A note on the Dutch Colonial Forces, which are distinct, is in the JOURNAL for May, 1902, p. 718.—E. G.

But of these, 9 Battalions Infantry are apportioned as Garrison troops. To these are added 4 Regiments = 40 companies of Fortress Artillery and 4 companies sp cially-trained armoured Forts Artillery, with 4 companies of Fortress Engineers.

Cavalry can be brigaded with the Horse Artillery when required.

The war strengths of the units are given as follows:—

Infantry.					Cavalry.				Artillery.				
—	Offrs.	Men.	Hrs.	Wgns	—	Offrs.	Mn.	Hrs.	—	Offrs.	Men.	Hrs.	Wgns
Field Bn. ...	17	894	18	6	Sqdrn...	5	131	133	Fd. Bty.				
Fortress Bn.	15	881	3	—					6 guns	4	156	123	8
									H. Art.	4	162	181	8
									Frt. Art.	4	169	—	—

The Militia has been re-organised. The period of service in this is raised to 8½ years for the land forces and 5½ for the Navy, 11,000 of the former and 600 of the latter being enrolled in 1901. When they are completing their eighth year the Militiamen are transferred to the Landwehr, the country being divided up into Landwehr districts under a commandant, and in this they continue to serve for 7 years, being formed into companies and battalions. Landwehr depôts for mobilisation are formed. Men are then called out for exercise twice in their 7 years.

ITALY.

Very few changes were made in the Italian Army in 1901. The chief attention under the vigorous administration of the young King has been paid to perfecting the existing organisation and troops.

The artillery is being gradually remodelled.*

Each of the 12 Infantry Divisions is organised for war as under:—

Infantry.				Cavalry.		Field Artillery.			Engrs.	Supply Company	Bearer Company
Brig.	Rgts.	Bns.	Cos.	Rgt.	Sqdns	Rgts.	Br Div	Batt.	F Cos.		
4	9 including 1 Bersaglieri	27	108	1	6	2	4	16 6 guns.	2	1	1

The Army comprises:—1. The Standing Army. 2. The Mobile Militia. 3. Sardinian Militia. 4. The Territorial Militia; the approximate strengths being as under:—1. 512,000 men. 2. 208,000. 3. 12,000. 4. 390,000. The total *rationed* strength being about 3,351,000 men, being nearly 183,000 in excess of the numbers last year.**

* A few notes regarding the artillery re-organisation will be found in the JOURNAL for April, 1902, p. 550.—E. G.

** See JOURNAL for October, 1901, p. 1189, and for July, 1902, p. 964-5, for details.—E. G.

Every able-bodied Italian man is liable to service from his 20th year with the Colours. After 3 or 4 years, or on reaching his 29th year, he is transferred to the Mobile Militia (Landwehr), and at 33 to the Territorial Militia till his 40th year, when all service liability ceases. About one half of the youths attaining the required age fail to enter the Service on account of disability, desertion, etc. Youths are not allowed to leave the country after their 18th year till their 28th, without special permission of the military authorities.

No manœuvres on a large scale were held in 1901, but Tactical Field Manœuvres were carried out in different Corps as usual, and the King attended those of the 1st and 2nd Corps, but not in state. It was more like a surprise visit in his motor car. Winter exercises of Infantry and Artillery also took place in the Mountain Districts, and snow shoes were made use of. Siege operations were carried on against Fort Bard.

RUSSIA.*

The peace strength of the Russian Army at the end of 1901 was recently given in detail in the JOURNAL for June, p. 807, and a summary was given in last year's Report, October, 1901, p. 1191. The details given in von Löbell's Report this year are voluminous, and cannot be epitomised here. The total *war* strength is estimated approximately as:—

——	Officers.	Men.	Horses.
In Europe	45,580	2,311,460	582,200
In the Caucasus ...	6,350	320,800	95,400
In Asia	4,570	222,000	52,700
	56,500	2,854,260	730,300

2 new Brigades of Finland Rifles, each of 4 Regiments, each of 2 Battalions, were formed in lieu of the 3 existing Battalions (one in each district). The period of service of the Finnish troops is:—

3 years with Colours.
15 years in the Army Reserve.
4 years in the Opoltschenie (National Reserve).
22

In many cases, after 2 years' service, the men are sent on furlough. In the Army Reserve they attend two trainings, lasting 6 weeks each. In the National Reserve the men who have joined during the last 4 years,

* A good account of the organisation, etc., of the Russian Army is to be found in an annual by Major C. M. (Zuckschwerdt, Leipzig, 1901.)

are trained in a like manner. In future about one-third of the men becoming liable to service will be called up annually.*

An Imperial commission has been sitting to report on the Cossack Service. The term of active service is to be reduced from 4 to 3 years, the preliminary training is to be completed earlier than heretofore, only 6 months being allowed before they are incorporated in their regiments for field training or war. They are to be given horses, equipment, etc., as well as arms.

The reforms in the Staff College, the Junker Schools, and other educational establishments, are detailed at length in the Report, which shows that good educational progress is being made. The Imperial Manœuvres in the Petersburg and Finland districts are briefly described, and the Mobilisation practices show what exertions Russia is making to keep her vast Army in readiness for any emergency, and at the same time pains are being taken to raise the tone and religious feeling of the men, which the Tsar is very anxious to further.

The United States of North America.

The new law of the 2nd February, 1901, replaced that of 1899, and laid the foundation on which the work of military reform will be reconstructed. President T. Roosevelt who succeeded the murdered President McKinley on the 14th September, 1901, and who has strong military proclivities and had some military experience in the late war with Spain in Cuba, and the Minister for War, Senator Elihu Root, who was appointed to that office after the war, seem to be personalities well fitted to carry out the necessary re-organisation. The War Minister has rapidly mastered the essentials of war administration. The President in his first message to Congress in December, 1901, insisted on the immediate necessity for improvements in the Militia and Volunteers, the National Guard system being antiquated and useless, and on the Militia being armed with the same weapon as the Standing Army, etc.

The Report gives the details of the United States permanent forces as well as of the troops raised and despatched to the Philippines, which we regret space considerations will not admit of reproduction, and a short account of the various military schools and institutions.

PART II.

Reports on the different Branches of the Service.

The Tactics of Infantry and of the Combined Arms, 1901.

General.—The campaign of the British forces in South Africa having, after the occupation of Pretoria, lapsed into Guerilla warfare, it is

* Some notes on the re-organisation of the Finland troops will be found in the JOURNAL for August, 1901, p. 1023.—E. G.

of but little interest to us Germans. The attempt to conquer the Boers by means of flying columns failed, because they always dispersed when they were overtaken and then assembled again only to repeat the process, and because the country was too vast to enable so active and mobile a foe to be coped with by ordinary methods. To secure his long lines of communication therefore, and to restrict the mobility of the Boers, Lord Kitchener had recourse to a blockhouse system. These defences, at first 2,700 metres and afterwards only 900 metres apart, were constructed along the lines of railway. They absorbed 135,000 men and 80,000 horses. They held from 10 to 15 men apiece, and in this exposure of small numbers to annihilation lay the danger. Moreover, the discipline of the force necessarily suffered. Major Callwell, in his brochure on "The Tactics of To-day" generalises too much and is inclined to extremes. He rightly urges the necessity for simultaneous action of Infantry and Artillery, denies the practicability of a previous preparatory bombardment by Artillery, and affirms the necessity of firing over the heads of the attacking Infantry until the moment of assault; for if this fire ceases, the assaulting troops are mown down by the fire of the Infantry of the defence, and suffer far greater loss than by chance ill-directed or timed shots from their own guns. He advocates complete extension of the attacking Infantry, even to the rear-most échelons, for all movements in close order are impossible within 2,000 yards of the position. He recommends a Battalion being formed for attack with 5 extended companies in front line finding their own supports in section columns with 150 yards distance between each. Two companies to follow in extended order at 300 yards distance, and one company, also extended, to follow these at 300 yards, so that a Battalion might fight on a front of 800 and a depth of 1,200 yards. The Report criticises this as impossible to keep up during the fight, for, where severe losses are felt, the extended lines would close on one another and towards the centre, thick close formations would result, and wide intervals would ensue between the different bodies, which is dangerous. Reinforcements must come up on the flanks, so that these wide intervals may be avoided, and this must be practised and the men instructed accordingly. It is impossible to keep single even widely extended lines directly behind one another when exposed to the enemy's close fire, unless all lie down.

The experiences of the South African war do not necessitate such wide extension. It was the want of adequate preparatory fire that was most felt. The extension of troops following in second line is, however, certainly unavoidable. The habit of firing only volleys was prejudicial to success, as was the advance by forward rushes before the preparatory fire had done its work. The short rushes had a bad moral effect on the men, who were with difficulty carried forward after many of these. Too much

importance was attached to Mounted Infantry. Suitable though these are for close reconnaissance, they can never replace cavalry for strategic reconnaissances or as an arm in battle. Modern Cavalry well supplied with machine guns and with horse artillery must be well trained to fight, and even when necessary to attack on foot. This the English Cavalry could not do, so a hybrid arm composed of Infantry and Cavalry men was constituted.

Sir Charles Warren, in the *National Review*, equally favours wide extension. He thinks a Brigade should fight on a front of about 1¼ to 1½ men to the yard. This may have been possible with the Boers, who carried out very little *active* defence. The excessive extension he advocates could not be carried out against more active foes, but with the present weapons greater intervals than formerly were customary are feasible, and the new Regulations issued in 1901 in different Armies take this into account.*

Infantry Tactics of Individual Armies.

Austria-Hungary.—The Austro-Hungarian Infantry received their new Infantry Drill Book shortly before the Manœuvres of 1901. The chief alterations are in the methods of fire. Volley firing has given way to individual fire. The command "Rapid Fire" has disappeared, for it is seen that the soldier is only too much inclined to this in action. Concentration of many rifles upon special points of the enemy's position is inculcated, but other portions most not be neglected. To this end a suitable distribution of the fire must be entrusted to neighbouring bodies, and opportunities are to be utilised annoying the enemy by the fire of even small bodies, when it can be delivered against his flanks and rear.

The companies are divided into skirmishing lines and company reserves, each company occupying a front of about 115 yards, each man occupying about 2 paces of front. The reserve follows *in close order* at a distance from which they can easily reinforce when required. The necessity of uninterrupted advance till within their own decisive range is constantly repeated in the Regulations, and the nearer this decisive position is to the enemy the better. The lie of the ground and the nature of the hostile fire will, however, chiefly determine this point. In the approach to this only such firing is to be carried on as is necessary to enable the attacking line to continue its advance, or to inflict decisive loss on portions of the enemy exposing themselves to fire. Long halts under fire are to be strictly avoided, and advance by rushes may have to be commenced from

* The Report quotes at length from the *Militär-Wochenblatt* and the *Jahrbücher* descriptions of the British methods of attack. These have already been summarised in the JOURNAL from February to June, 1902, so are not repeated.—E. G.

a long distance. The Regulations recognise the difficulties attending the simultaneous advance of long lines, and order that this is not to be undertaken by larger units than companies, and that these forward rushes are to be as long as possible; but this is to be regulated by the nature of the ground, the condition of the men, etc. Details are given, showing how this and how reinforcements are to be carried out.*

When the assault takes place a certain portion of the force is to be kept back to fire on the point of assault, or upon any counter-attacking troops. There is great danger in this of the assault being made with too weak a force. At 100 yards from the position fire ceases, the leader calls out "Assault," and all rush forward without crowding together. If a counter-attack straight to the front is made from the position, the assaulting troops throw themselves down and drive it back by rapid fire. If from a flank, the reserves deal with it.

On the defensive, advanced positions may be held if the enemy can be better brought under fire from these, or to gain time and mislead the attackers as to the real position, but this must not be allowed to degenerate into such engagements in front of the main defensive position as would defeat the object for which this is taken up. Night attacks and fighting in close country are thoroughly dealt with.

France.—The manœuvres near Rheims of the 1st, 2nd, 4th, and 28th Army Corps under the direction of General Brugère in September have been often described. They partook much of the show character. They were however a proof of the training of the three arms to work together with well-combined effect. The reconnoitring of the Cavalry was defective, and in action it was not a success, though the Corps Cavalry Brigades were occasionally well thrown into the fight and disengaged troops in critical situations. The Artillery was employed in masses, 20 Batteries being brought into line on the 19th. Greater attention was paid to cover than to fire effect.

The 7th Corps practised defending long lines of railway, 62 miles of the Belfort-Paris line being watched by Territorial Troops.

The provisional new "Infantry Training" was issued to the 9th, 11th, 17th, and 18th Army Corps. Opinions as to its merits differ, and it is being tried in other Corps also. Among the chief changes are the abolition of volley-firing and of Infantry scouts, the restoration of the supports in attack, the substitution of fours for files in certain cases, and the formation of fours by a short wheel as in the Cavalry. Bayonets are not to be fixed on the approach of Cavalry, and closed formations are only exceptionally to be adopted when continually threatened by these.

* These Regulations do not get over the difficulty of the large target offered by the men all rising simultaneously to rush forward together, nor of the loss of fire entailed thereby.—E. G.

Troops formed for attack or defence are formed into three bodies: the firing line, the assaulting line, and the reserve. The firing line in attack forms its own supports; in defence these become local reserves. The assaulting line forms the actual storming party in attack, and in defence delivers counter-attacks. The reserves are both in attack and defence to be kept intact as long as possible, and only engaged to secure victory or avert defeat. They are at the disposition of the commander of the force, and thus ensure unity of action at the decisive moment.

A French Infantry Division is reckoned to have 12 Battalions. The above division of the fighting troops into three bodies does not tally with the present French organisation, which is based on coupling the units by pairs,* so a breaking-up of tactical units is inevitable. As each of the three bodies above-mentioned has moreover distinct functions assigned to it, which do not come into play until the body in front has fulfilled its part, a sort of échelon formation results with all its disadvantages. However correct theoretically the division of an attacking body into firing line and assaulting line may be, in practice it leads to difficulties.

The planned attack is the basis of the French regulations, which divide it into march, deployment, preparation, assault, pursuit, and reformation. From 1,200 to 600 metres the advance is to be with extended files. The firing line is not to fire till it is necessary to do so in order to advance. Troops making a demonstrative attack only are not to advance nearer to the position than 600 metres. The assaulting line advances, taking advantage of cover, till within 200 to 300 metres of the firing line, when it is about 150 metres from the enemy, and has turned every rifle upon the point of assault. When the Divisional Commander thinks the enemy sufficiently shaken, he gives the signal for the assaulting line to advance, which moves rapidly forward, without troubling about guarding their flanks. The firing line continues to fire as long as possible; then the whole mass, fixing bayonets as it advances, precipitates itself, with shouts, on the enemy.

On the defensive, advanced positions, concealing and covering the main position, are recommended. Fire is sometimes to be withheld, to deceive the assailant, as the moral effect of great, sudden, unexpected loss is unnerving. Counter-attacks are to be made to relieve any part of the position which is endangered, and under cover of these the great counter-stroke is prepared. Such partial counter-attacks may be made by any commander of a closed body of troops when he sees his opportunity; but a general counter-stroke by order of the commander of the force only. This general counter-attack should, as a rule, be made

* The writer means that there are generally 2 Infantry Divisions in a Corps 2 Brigades in a Division, 2 Regiments in a Brigade, etc.—E. G.

before the enemy captures the position ; but if this cannot be done, then immediately after the assault, when he is in confusion and has not yet established himself. Defensive fire may be opened when the enemy is about 1,200 metres from the position.

Germany.—On the 1st April, 1901, 5 machine-gun detachments, each of 4 guns (drawn by 4 horses), 3 officers, 9 N.C.O.'s, 58 privates, 2 ammunition wagons, 1 baggage wagon, and 34 horses, were added to the establishment.

Machine guns can be used when the distances are known for firing over the heads of our own Infantry.

Patrol commandoes have been established in some Army Corps, selected men (jägers, etc.), to creep forward as Infantry scouts and observe the enemy, warn the troops against premature advance and against impending counter-attack, etc., and occasionally of opportunities that offer for flank attacks, etc.

Provisional Regulations for the employment of captive balloons have been issued. (For other changes see JOURNAL for March, 1902, p. 408.)

Great Britain.—New instructions for Infantry Training are about to be issued.

Russia.—In 1901, a new edition of the "Regulations for Field Service and Battle Instructions," by General Dragomiroff, was issued to the troops. These are similar to those in the German "*Felddienst.*" In marches not more than 2 to 2¾ miles an hour are to be reckoned, and a short halt is to be made after every hour. More stress than formerly is now laid in attack on fire effect and in defence on counter-attack. A great point is made of the advantage of night attacks. Before an action the soldiers are to be carefully instructed as to the part they are to play.

An account of the Grand Manœuvres at Koursk is in the JOURNAL for July, 1902, p. 967.

CAVALRY TACTICS.

General.—The rich experience gained by the British Cavalry in the South African campaign is of great value for European war, though their circumstances were peculiar.

Notwithstanding their excellent training in riding, etc., and their fine horses, the expectations formed of them were not realised. But the Cavalry of many another European nation would in like manner have failed, for none are sufficiently trained in dismounted action to enable them to cope with the Boers, and the difficulties of reconnaissance, owing to the far-reaching modern rifles in use and to smokeless powder, are enormous. Owing to the increased effect of shrapnel, columns moving

within its range suffer great loss. The English now move from cover to cover in single line.

Mounted Infantry was added to help the Cavalry in its manifold duties, and experiments are being made with Cyclist companies. Every British Cavalry Brigade possesses a Maxim gun detachment,* and lately each Yeomanry Regiment one Maxim gun. The distribution of machine guns to Cavalry is much discussed in all important Armies, and their advantages are generally recognised.

As regards the use of cyclists with Cavalry, no country, excepting Great Britain, has any organised bodies of cyclists, and the proper method of their employment is still under discussion on the Continent, though cyclist detachments have been tried experimentally as fighting bodies at all the great manœuvres.

The question of the lance as a Cavalry arm is still being argued. In Austria Major-General von Czerlien disputes the superiority of the lance, and the wisdom of its adoption by Germany. He does not, however, appear acquainted with the reasons for this or with the question at issue. The Belgian Colonel van Clorten wishes the whole Belgian Cavalry to be armed with the lance. In France all the front ranks of the Dragoon Regiments are now to carry lances.

In England all the Lancer Regiments and the front ranks of Dragoon Regiments are so armed. But it is held there that a good rifle is of more importance than either lance or sword, and the two Cavalry Regiments which left in December, 1901, for South Africa were armed with the Lee-Enfield long rifle. The Yeomanry are now armed and trained as Mounted Infantry.

Cavalry in Individual States.

Austria-Hungary. — The Report mentions the great Cavalry Manœuvres in the Marchfeld, near Wagram, at the end of August, 1901, under the Archduke Otto, commanding a Cavalry Division. But the few details given are of no special interest. It brings to notice an extraordinary long-distance ride carried out by Lieutenants Count Beroldingen and Streintez, of the Emperor's Own Regiment No. 1; between Stanislau and Czernowitz, a distance of nearly 85 miles, of which 16 had to be done on foot, leading the horses. The road was an unknown one, and the weather frosty. This was accomplished in 17 hours, or about 5 miles an hour, without halting to feed, etc.

* Each regiment had one Maxim gun, and each company of Mounted Infantry one, making five Maxim guns in a Cavalry Brigade. Machine-Gun Detachments will now probably have 2 M. Guns each.—E. G.

The quality of the Austrian Landwehr Lancers is much praised, as, though only 30 per cent. are practised yearly in manœuvres, they are in no wise inferior to the Regular Regiments.

France.—The great Cavalry Manœuvres of 1901 in France (near Troyes-sur-Seine) are of especial interest. The Regiments of the Cavalry Divisions were formed with 5 instead of 4 squadrons. The proposal to arm all Dragoon Regiments with lances was to be tested. Each Cavalry Division was to comprise, besides its Cavalry Regiments, the following :—

An Infantry detached company of 165 men on bicycles.

A Machine-gun detachment.

An Engineer detachment of 30 men on bicycles.

The Bicycle Infantry were to be employed as messengers, reconnoitrers, and, in case of necessity, in support of the Cavalry in battle.

The Cavalry organisation was itself provisionally altered.

Hitherto the 7 Cavalry Divisions each consisted of 2 Cavalry Brigades, 6 Regiments, and 2 Batteries Horse Artillery; and in each Army Corps there was a *Corps*-Cavalry Brigade, which detached one squadron to each of the two Infantry Divisions in the Corps as Divisional Cavalry.

At the Troyes manœuvres two Cavalry Divisions of 4½ Regiments each opposed one another, one in the west one Division of 5 Regiments manœuvred against a Brigade.

The proposed new organisation would give 11 Heavy Cavalry Divisions each of 5 Regiments of 5 squadrons and 4 Light Reconnaissance Cavalry Divisions of 6 Regiments (5 squadrons), and further a Light Cavalry Division from the Algerian Corps to be formed if required.

These proposals do away with Corps and Divisional Cavalry. These can be replaced by some Reserve Squadrons and Cyclists.

It is doubtful, however, if this re-organisation will take place. The exercises with Cavalry Divisions of 5 Regiments each were only a test.

At the Great Manœuvres near Rheims, 2 Cavalry Divisions each of 6 Regiments were allotted to each opposing force. We have not space to follow the Report in its detailed summary of the above-mentioned manœuvres, but Lieut.-General von Pelet-Narbonne gives his opinion in No. 105 of the *Militär-Wochenblatt* of 1901 that the lessons drawn from them by French Cavalry officers is that the Echelon Formation and Movements had become a perfect mania. The Regulations prescribe échelon with one advanced flank with advanced centre, and with both flanks advanced. The formation intervals and distances are left to the Commanders of Échelons (lines). In attacking Infantry at Arcis-sur-Aube the Cavalry Corps attacked two Brigades in single rank, chequerwise, in 4 lines, each 150 metres behind the other, and the squadrons

écheloned at intervals of 150 metres. The whole front of the attack was 2,400 metres by about 450 metres deep. On the left flank a brigade was écheloned as a protection against hostile flank attack, and a Regiment followed in reserve. The attack adequately prepared by the Artillery was considered quite successful.

The experience gained with the new Field Guns at the Troyes Cavalry Manœuvres is interesting. The two Cavalry Divisions were each given 2 batteries of 4 guns each of the new pattern 75-mm. (2·95-inch) calibre, instead of the present service 80-mm. (3·15-inch) gun. The new gun did not answer for Cavalry owing to its weight, the time taken in limbering up, and to the difficulties in trailing the gun laterally. The weight decreases mobility. Owing to the spade, which on discharge digs deep into the ground, both the quick limbering up and the rapid change of direction of fire—as objectives quickly present themselves in a Cavalry action—are hindered, and it is considered that a gun without any spade to check the recoil is necessary for Cavalry.

The manœuvres in August of the 1st and 2nd Army Corps and 4th and 5th Cavalry Divisions under General Duchesne, and the 6th and 20th Army Corps and 2nd and 3rd Cavalry Divisions under General Kessler, between Vouziers and Rethel, are briefly described in the Report. The weather was very bad. These manœuvres closed with a grand spectacular Tactical Field Day before the Tsar, when the arrangements were very good and the troops skilfully handled. General Brugère commanded 4 Army Corps and a Cavalry Corps of 3 Cavalry Divisions against a smaller force representing the enemy.

Germany.—On the 11th May, 1901, the German Cavalry received their new musketry regulations, assimilating the targets, etc., to those of the Infantry, and more attention is being paid to their training in shooting. New regulations for the Cavalry Telegraph School have also been issued. Experiments in methods of crossing rivers by means of rafts, floating bags, lance-boats, etc., are being actively carried on. In the German Army trials with the "Radeau-Sac" and the Reysch lance-boats were made by the Hussars of the Guard Corps on the Havel. It is found that the collapsible boats are insufficient, and that a light portable equipment is needed on which the Patrols can quickly cross a stream. The canvas folding-boats in use being much liable to damage in transport, experiments were made last year with light steel boats.

In the German Army Manœuvres in West Prussia the Red Cavalry, Division A, gained the victory over Blue's Cavalry by early deployment into suitable attack formation, opportune unity of attack and skilful use of its H. A. batteries and machine-gun detachments, whereas the Blue Cavalry brought its artillery too late into action, deployed too close to the enemy into squadron columns, whereby the Brigades in the rear were

brought into action too late to be of effective use. One of its Regiments, advancing without due caution, was moreover surprised by the 1st Red Cavalry Brigade and put out of action.*

No increase of the German Cavalry is yet contemplated. After the increase of Artillery is effected, third Battalions will be raised for those Regiments which now only have two. The wish often expressed in these Reports for the permanent organisation of Cavalry Divisions in peace is still far from realisation. After the recent changes, placing the Field Artillery Brigades under the Infantry Divisional Commanders, the Cavalry Brigades are not likely, as a matter of principle, to be withdrawn from them. It is feared to make too much a special arm of the Cavalry, as was the case with the Artillery.

It therefore is all the more important that year by year a larger number of Cavalry Regiments should be gathered into Cavalry Divisions for manœuvres as such. As now the opinion is gaining ground in Germany, that a whole Cavalry Regiment** is not required as Divisional Cavalry, but that half a Regiment will now suffice for this, there will be more squadrons available for manœuvre in Division; and as no Cavalry Divisions are permanently formed in peace-time, it is more necessary than ever that Cavalry Brigade and Regiment Commanders should then have opportunities for yearly practice of Cavalry Reconnaissance on a large scale and in the quick and skilful manœuvring of large bodies of mounted men; and the more this is done the easier will be the task of the leaders on a sudden outbreak of war.

The recent (1901) manœuvres in West Prussia show how skilful leading of Cavalry may result in victory, even over forces much superior in numbers. Well-judged utilisation of the fire-effect of his own Artillery to press home opportunely well-combined attacks of the Cavalry Brigades, were prime factors which brought about victory.

The Expedition to China.—The experience of the transport of horses from America to China shows the importance of fresh air and water, and of good and sufficient feeding. As a width of only 2½ feet could be allowed for each horse they could not lie down, so those horses which showed excessive fatigue were supported by a broad band of canvas under the belly. This band was fastened up at the four corners to take the strain off the legs.***

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* The general run of these Manœuvres was briefly described in the JOURNAL for January, 1902, though details were not gone into. See also JOURNAL for December, 1901, p. 1514.—E. G.

** A German Cavalry Regiment has 4 fighting squadrons.—E. G.

*** British officers are of course familiar with similar arrangements on well-filled Horse Transports.—E. G.

The American horse is of plebeian origin compared to the North Australian, and is of much less value as a riding horse, though of great use for draught. Only 30 horses altogether were sent out from Germany with the expedition troops. However, in the autumn of 1901, 400 horses and 100 mules were shipped from China to Germany to see what losses might be expected on the passage through the Red Sea. Owing to great care and to their being daily exercised on deck, they all arrived safely.

Great Britain.—In South Africa the British Cavalry did not fulfil the expectations formed of it, though it had good riders and well-trained horses in its ranks. Excellent as its horses were, they were spoilt by too careful grooming, over-feeding, and by being practised only over favourable ground. When the test of war came with unfavourable climatic conditions, unavoidable night exposure and, abnormally heavy work over heavy ground, they broke down. The riders were insufficiently trained in reconnaissance, dismounted action, and shooting. The horses rapidly collected from Hungary, Australia, North America, Argentina, and India, and shipped to S. Africa, were sent up to the front without any preparation immediately after disembarkation, and naturally succumbed. The heavy riders, with their heavy equipment, quickly broke down these weakened animals, from which extraordinary efforts were perforce required, and so their performances in no wise equalled those of the Boers. In attack, for which opportunities seldom occurred, they were either overpowered by the steady well-aimed fire of the Boers, or the latter, leaping on their well-trained ponies, rapidly rode away to take up fresh defensive positions, the British Cavalry having no chance whatever of catching them.

Owing to insufficient reconnaissance the British Generals were often badly informed of the enemy's movements, and, owing to indifferent measures of security, surprises throughout the whole war were the order of the day. Their bad training in shooting led to their defeat in action.

As the Cavalry utterly failed, Mounted Infantry were organised.* These were able, when superior in numbers to them, with the help of Artillery and machine guns, to take up the fight with the Boers. But they could not carry out the required reconnaissance, for they could not ride. Their want of knowledge of horsemanship and of the proper care of horses led also to greater waste of horseflesh than with the Cavalry themselves.

At the same time, Lord Roberts owed his comparatively quick and victorious advance to Pretoria to his systematic use of strong mixed detachments of Cavalry, Horse Artillery, and Mounted Infantry to envelop the flanks of the Boers in position. It was owing to this dis-

* The writer apparently thinks that no Mounted Infantry were sent out before this.—E. G.

couraging action, forcing their constant retreat, that the organised resistance of the Boer Republics was broken.

In the guerilla warfare which followed, the Boers could take full advantage of their warlike qualities as trained indefatigable riders, and as active, skilfully shooting Infantry skirmishers. They owed their knowledge of their opponents' movements to the inhabitants, not only of their own country, but of the Cape Colony, being favourable to their cause.

The conduct of the war by the British was therefore impotent, notwithstanding their superiority in numbers. Masses of Infantry are scattered over long lines of communications in guarding railway junctions, blockhouse lines, and in garrisoning important places.

The Cavalry, Mounted Infantry, Yeomanry, Mounted Colonial Corps are all hurried off to hunt down the Boers, who avoid the unequal combat, but take every opportunity of laying an ambush, effecting a surprise, or destroying railways, etc., and, though occasionally they have met with heavy losses, it looks as if they would be able to continue the war for a long time yet.

England is however at the end of its military resources. It becomes daily more difficult to comply with Lord Kitchener's urgent demands for trained mounted men and horses. There is scarcely any Regular Cavalry left in the United Kingdom, and, in spite of the high rate of pay offered, few volunteers are forthcoming.*

A first experiment** was made on the 24th August, 1901, with folding-boats of the James pattern, four of which were fastened together forming a raft to carry the guns of a Field Battery across the Medway, here 150 metres wide. The horses swam across and the men crossed in James boats.

Russia.—Cavalry manœuvres of large bodies were held in the St. Petersburg military district, in the Wilna at Grodno, and on the lower Dwina; in the Warsaw district between Warsaw and Siedlee in the Kief district; in the Moscow district between Smolensk and Oral; in the Odessa district near Bender, and in the Caucasus near Tiflis. The Russian Cavalry training, which is facilitated by its permanent organisation, and by the yearly increasing number of Cavalry Divisions, exercised in great Cavalry manœuvres, is certainly very good. No other European Cavalry is given such opportunities for improvement.

In the Cavalry swimming exercises at Maera, near Korno, on the 30th July, a whole Cavalry Division crossed the Niemen, here 280 metres wide. The arms, accoutrements, and clothing of the men and the horse equipment were carried across on small rafts made out of fascines of

* This Report was published in Germany, in February, 1902.—E. G.

** Experiments with folding-boats were made in England many years ago. See the JOURNAL for April, 1895, etc.—E. G.

straw and light boards, which were attached to the horses' tails. Some guns were drawn through the stream by long towing-ropes. The horses were sent across three abreast, about 10 paces distance apart, and each squadron took about 7 minutes swimming across. The lieut.-general commanding the Division also swam over.

In the Wilna district the officers of the Cavalry School were practised in the paper chase and in hunting, after the English fashion, the chase being every other day after some wild animal with a pack of English foxhounds. Officers awaiting promotion as regimental commanders have to lead.*

Field Artillery Tactics.

General Report.—The considerations regarding the armament and re-organisation of Field Artillery, which were weighed and discussed in 1901, have not led to any decisive action in the Armies of some of the Great Powers. On the whole there is a tendency, which we think correct, to allow time for technical development to devise a gun which shall satisfy the highest ideal. Even if this one idea of a barrel-recoiling gun has a great future before it, we must remember that practically this system is as yet only in its infancy, so that over one haste would be a great mistake and might lead to serious and irremediable consequences.

The "*Battle of the Modern Field Gun*" is being fought in Germany also, though the field gun which has been introduced here has in every way answered expectation. No doubt we shall in course of time still further improve our armament, in accordance with technical progress and with the advance of other nations, but it would be premature to indicate now the "when" and "how." We must, in determining the question whether we are bound to haste in this matter, consider not only the possibly exaggerated advantages of foreign material, as set forth in foreign literature, but also the defects which have shown themselves, and must not rely on performances regarding which only untrustworthy reports are yet to hand.**

A field gun that like the French is so heavy when unlimbered cannot nowadays be considered *tactically* efficient.

A gun which recoils on its carriage facilitates the use of protective shields more than one of which the carriage itself recoils. The question of these shields has been discussed from different points of view ever since the publication of the Langlois work (see *Militär-Wochenblatt*,

* If some of our mounted officers were trained on this excellent plan we should hear fewer complaints about their riding.—E. G.

** They are spending so much on their Navy in Germany, that the military experts may perhaps be disposed to minimise the necessity for further expenditure on new guns.—E. G.

Nos. 37, 49, 50, of 1892), and in France still many hold the protection afforded by them insufficient. Neither Russia nor Italy has adopted them. Belgium and the United States have.

The French lay great stress on rapid fire, and consider that, even after the reduction of their Batteries to four guns, one of their Batteries is superior to two or three German ones. This is a delusion. Peace experience shows that when rapidity increases beyond a certain rate of fire, efficiency decreases. This limit of *effective* rapidity of fire is more a matter of the *quality* and training of the gunners than of the nature of the gun.

The question of the reduction of the number of guns per Battery is bound up with the necessity or otherwise of increasing the total number in an Army Corps. It was at first thought in France that they must have 120 per Army Corps to match against the German 144.* The French have now only 96 guns per Army Corps. The French Batteries are now supplied with 144 common shell.

In a few Armies the Corps Artillery has been given up, and the batteries distributed among the Infantry Divisions, so as to give the commanders of these in peace-time a knowledge of this arm which they would have to wield in war, and in order to better understanding of the working of Artillery by the other arms of the Service, it is now customary for field officers of all arms to attend the Artillery instruction courses and practices.

The French complained that only Mountain Batteries were sent to China, so some 75-mm. Field Batteries were sent out later, but they did not arrive in time for the Relief of Pekin. Mountain Batteries were on the whole more suitable to the bad roads of China. But the German Field Batteries and the light Field Howitzer Batteries were able to follow the troops wherever they went, even in the hilly country.

Artillery Tactics in Different Armies.

Austria-Hungary.—In September, 1901, the following troops were exercised in the attack of an intrenched position near Veszprim, north of the Plattensee, with live shell:—2 Regiments Infantry, 2 Squadrons Hussars, 4 Batteries Divisional Artillery, 1 Provisional Battery, and 1 Battery of Position Artillery with Engineers and a Captive Balloon. These troops made a two days' march to the battle-field, and at once made dispositions for the attack, which were carried out as in

* The number of Batteries attached to each Infantry Division in the German Army now varies slightly. On the average it may be taken that there are with each Division 2 Field Artillery Regiments of 2 Abtheilungen (Brigade Divisions), which comprise 3 Field Batteries each, and 1 or 2 Horse Artillery Batteries in peace-time. There is no Corps Artillery.—E. G.

war. After the bombardment the rest of the fighting was carried out with blank ammunition and a counter-attack warded off.

The Artillery well prepared and supported the Infantry attack, and the aim and timing of the bursts of the common shell and shrapnel were good, but the effect on the defender's well-covered Infantry and the guns in sunken emplacements was slight. This has led to the conclusion that light Field Howitzers for covered fire must be provided. It is intended to re-organise the Artillery service, each corps, and Divisional Artillery Regiments being into 2 Brigade Divisions each composed of 3 Batteries. The latter are to be reduced in size from 8 to 6 guns. Each Corps Artillery Regiment will probably be also armed with 2 or 3 light Field Howitzer Batteries.

France.—The new (Provisional) Artillery Training of the 16th November, 1901, shows what ideas prevail in the French War Office in regard to the principles which govern Artillery Tactics with the 75-mm. (2·95-inch) Q.F. Field Gun. But the new drill has not been fully tried by the troops. It is to be reported on the 15th October this year. Four gunners are required on ordinary ground to move the gun, and six men for the ammunition wagon.

The Report goes into details of quick firing, salvos, etc., which we have not space for.

The Field Battery is divided into sections, with wagons, as follows:—

——	Guns.	Ammunition.	Field Forge.	Artillery.	Forage and Provision.
1st Section .. .	2	2	—	—	—
2nd „	2	2	—	—	—
3rd „	—	5	—	—	—
4th „	—	3	1	1	3
Total ..	4	12	1	1	3

Its strength is 1 captain, 3 lieutenants, 170 men, and 167 horses, and carriages as above. One gun and wagon constitute a half-section.

The fighting portion consists of the guns and ammunition wagons.

The principles of action are to act if possible by surprise, to pour in a rapid and effective fire on well-chosen objectives, and, if possible, to do so from hidden spots, the most careful use being made of the ground, especially in opening distant fire.

The offensive spirit is thoroughly inculcated: no retirement without orders, and every effort to be made to obtain preponderance and rapidity of fire, the heavier guns being brought under the Artillery commander to ensure unity of action when required.

Corps Artillery *is not abolished in France*, but each Division has a half-regiment of Artillery attached to it for tactical purposes, and placed under the Divisional Commander in camp or garrison. An Artillery Regiment of 12 Batteries is divided into two portions, each of 6 Batteries. For this, one portion commanded by the colonel, and the other by the lieut.-colonel second in command.

The Reports concerning the new Artillery in the autumnal manœuvres are satisfactory. They worked well with Infantry, but here and there a want of understanding with the chief command was perhaps apparent.* Some Reports declare that in spite of its weight the new gun was mobile enough. On the other hand, it was observed that in heavy ground it was necessary to double the gun detachments to move the gun about, and even sometimes to call on the Infantry for assistance.

At the Cavalry Manœuvres the gun was tried with the Horse Artillery, for which it was scarcely mobile enough, and unlimbering for action took too long. The Artillery are to change stations frequently, so as not to shoot over the same ground always. A new Field Artillery School of Gunnery has been established at Poitiers.

Germany.—In the 1901 manœuvres the advantage of the abolition of the Corps Artillery and placing it under the command of the Divisional Generals was proved. As a rule the Artillery deployed by Brigade or Regimental Divisions, and want of space was not felt. The endeavour to work in unison with the Infantry and the successful support of other arms was conspicuous. The effectual concentration of fire, in situations where such action would just turn the scale, and a laudable desire to be well forward in supporting the Infantry attack, were equally notable. The ground was skilfully utilised for cover and the spade was frequently and suitably employed for entrenching.

In the course of the summer the practice of the attack on entrenched positions was carried out in 3 Army Corps with live shell and ball ammunition, and in these the Heavy Artillery took part. At one of these near Thorn it was shown that the curved fire of our Light Field Howitzers, well handled, was excellent, scarcely visible shelter trenches with overhead cover having been effectively shelled. The united action of the Infantry and Artillery showed good progress, and the Field and Position Artillery worked well together, being directed either by the senior Artillery commandant or by the commander of the whole force himself. The excellence of the shooting proved the excellence of our material, the detractions of foreign literature notwithstanding.

Great Britain.—The Report is here chiefly taken up with a résumé of Major Callwell's "Tactics of To-day," a brochure well known doubt-

* The Reports from S. Africa of Artillery officers show how imperfectly some of our own generals were acquainted with the capabilities of the various kinds of guns, etc.—E. G.

less to our readers, so its retranslation is unnecessary. It mentions the proper choice of ground and concealment of guns as one of the important lessons, and the difficulty of coming up and occupying a fire position simultaneously in the old method. Also of the Field Artillery Batteries following the Infantry in the close assault.

The writer also briefly quotes some papers in the "Proceedings of the Royal Artillery Institution," and wonders at the absence of good Field Glasses in our Batteries.* He quotes a writer who from his war experience urges the sending forward of only 3 ammunition wagons at a time in action, and thinks these should always be behind the intervals between the guns (not each covering its own gun).

Small Arms, 1901.

General.—The opinion, founded on the experience of the South African War, that it is inadvisable to reduce the present calibre of rifles, gains ground. Dr. F. A. Suter, who served in the war with the Swiss Ambulance has reported in detail in his interesting book on the subject, published by Schmidt und Günther, of Leipzig, in 1901, on the wounds effected by rifles of small calibre. In the *Revue d'Artillerie*, August, 1901, Captain L. Fossart examines the question in the light of previous war experience, and comes to the following conclusions as regards the effect of modern weapons:—

1. The proportion of men killed and placed *hors de combat* relative to those struck remains as before.
2. When wounds are not mortal they heal quicker, and their consequences are less serious, so that for the number of men incapacitated during the whole campaign is less than before.
3. The effect as regards individual men placed *hors de combat* is less.

Captain Fossart thinks that there would be no advantage in making the calibre more than 8 mm. (·315 inch), but rather in its decrease, for although its wounding power is less, ballistic and ammunition considerations outweigh this. On the whole, there is no inclination in individual States to lessen the calibre, but to introduce so-called self-loaders of the existing calibre. France and England, who are about to adopt armaments, intend to introduce a rifle which will enable the firer to aim steadily.

*Every Battery commander should be provided with a *good* telescope, and every officer and sergeant with a powerful field glass. I believe the Government are now making arrangements for this. A thorough system of observation and signalling should be established and constantly practised.—E. G.

"Self-loading pistols are even more in demand, and the "Parabellum," of "The German Arms and Ammunition Factory" of Berlin, is an example of a hand weapon admirably adapted in all respects for war.

In the *Kriegstechnische Zeitschrift, 1901* (*Vol. 8*), an Austrian officer proposes for drill purposes, manœuvres, etc., a sort of safety case which being inserted in the bore diminishes its calibre by 1 mm. and thus will only admit the blank cartridges which are to be made of slightly less calibre than the ball cartridges. This will obviate the serious accidents that often occur through the issue in error of ball cartridge at manœuvres.

Progress in the Armament of Individual States.

Austria-Hungary.—Experience with the Repeater Rifle pattern of '88-'90 and the Repeater Carbine led to the construction of new patterns in 1895. There was not sufficient difference however between these and those of the old pattern to necessitate a universal re-armament of the troops, so the conversion of the old '88 pattern was stopped for financial reasons, and it was decided to issue the new '95 pattern rifle to Infantry and Rifle Battalions as soon as the old ones were worn out, and the Field and Garrison Artillery and the Supply Corps which had to be given new rifles were armed with it. The Cavalry were re-armed with the '95 pattern carbine, their old carbines being handed over to the Train Troops. The trials with the new weapon proved it to be satisfactory.

Some details of a new pattern Repeater Rifle made in the Steyn Small Arms factory, and called the Mannlicher-Schönauer Rifle of 1900, are as follows:—Calibre 6·5 mm. (·256 inch); weight without bayonet, 8 lbs. 2 ozs.; length without bayonet, 4 feet 4 inches; with bayonet, 4 feet 10 inches; length of barrel, 2 feet 4 inches; weight of cartridge, 22·43 grammes (·79 oz.). The bolt action is somewhat like that of the Mauser, with a turning movement to open and close the breech, etc.

Another self-loading rifle of the same calibre on the Mannlicher system has been turned out by Seidel & Son, of Vienna. Other calibres are also made.

Belgium.—The Infantry, Cavalry, Technical Troops, and the Burgher Guard are armed with the 7·65 mm. (·301 inch) Mauser '89 pattern.

France.—The Infantry is still armed with the Lebel rifle, calibre 8 mm. (·315 inch), pattern '86; the Cavalry and Artillery with carbines of that pattern. The Train troops are said to have still retained the old Gras pattern '74, calibre 11 mm. (·433 inch), which is however scarcely credible.

The armament of the troops with the Daudeteau rifle seems to have fallen through, unless this has been carried out as secretly as the introduction of the new Q.F. field guns was. But according to press reports, "self-loading" instead of repeating rifles are to be adopted. One of

these, which has a magazine in the butt containing 16 rounds, is, it is said, being tried in the 9th Corps in Algeria. The cartridges fit over one another in the butt in four parallel rows. These can be drawn into the breech by pressing a spring without taking the rifle from the shoulder. It is called the Lamaechia rifle and is ballistically similar to the Lebel, but has a calibre of 8 mm. and weighs only 6·7 lbs. Meanwhile the muzzle velocity of the Lebel is increased to 2096 fs.

This new French powder is said to give the following comparative results :—

Lee-Metford Rifle...	Cordite	= 1834 fs.
	New French Powder	= 2379 ,,
Mannlicher ...	Russian Powder	= 1712 ,,
	German	= 1919 ,,
	New French Powder	= 2329 ,,

In France many voices cry out against any diminishing of the Lebel calibre (·315 inch) in any new rifle to be adopted.

Germany.—At the close of the year included in the Report the Guards, the Marine Infantry, and the Infantry of the East Asiatic Brigade were armed with the 1898 pattern. This was briefly described in the JOURNAL for October, 1901, p. 1215. It is about to be issued to one Prussian Corps. A new short rifle of the '98 pattern, a sort of carbine, is on trial. All the other corps still use the old '88 pattern rifle. According to the report of the Special Committee in Berlin, the '98 rifle is said to have evinced its superiority over those of all the other contingents. That of the English was the worst.

A self-loading pistol is prescribed in the dress and equipment regulations for officers and men of machine-gun detachments, signallers, etc. The actual pattern is not yet decided on. The Mauser pistol (described in the JOURNAL for November, 1900, p. 1323) and the "Parabellum" self-loader, 1900 pattern, are the principal rivals, and the latter will probably be successful in the trials in Germany as it has in other countries. The following are some of its chief details :—Calibre, 7·65 mm. (·301 inch); length of barrel, 4·8 inches; total axial length, 9·33 inches; depth, 5·3 inches; weight, 1 lb. 13½ ozs.; do. of cartridge (loaded), 16½ grs.; penetration at 50 metres—fir, 6·3 inches; beech, 3 inches; sheet iron, ·34 inch. It is said that with expert shooting and clips ready to hand it can fire 100 shots per minute.

Its durability and non-liability to get out of order are remarkable. Official trials made when 3,000 shots were fired with powder charges 25 per cent. heavier than the ordinary ones, resulted in the weapon being in no way damaged, thereby demonstrating its absolute security, the breech-closing arrangement being very perfect. It has no hammer. In connection with the locking mechanism, the safety catch is so arranged that it works automatically, so that it cannot go off unless gripped in the

hand for firing in a particular way. This safety when hanging by its cord or in its holster, or even when it falls to the ground violently, is of priceless value to the person using it and his surroundings. At the same time, its repeating arrangement is such that immediately after the delivery of each shot the firer can discharge others in rapid succession. Further details of this excellent weapon are to be found in the Swiss *Militärische Blätter*, 1901, Vol. XII., and in the company's description, published by Eisenschmidt, Berlin.

Many experiments with small-bore rifles have taken place at Spandau, the result of which is that the present calibre, 7·9 mm. (·311 inch) will probably be adhered to, as we indicated in the Report for 1900. A certain Louis Schlegelmilch is said to have brought before the authorities a magazine rifle that will contain 10 rounds. He is an employé in the Royal Arms Factory at Spandau.

Great Britain.—The European and the greater part of the native troops in India carry the 7·7 mm. (·303 inch) Lee-Metford rifle of '91 or Lee-Enfield of '95. The native levies carry rifles of old construction and of different patterns, Martini-Henry, Snider, etc. The officers carry the Lee-Enfield or a revolver.

Small Arms.

Great Britain.—The inferiority of the present Lee rifles compared to those of other Powers is now acknowledged even in the Army. Notwithstanding the declaration of the War Minister in 1901, the fiasco of the Lee rifles can no longer be concealed. According to reports, especially in *Arms and Explosives* of July, 1901, great stress is laid upon the necessity for any new system introduced being able to use the existing ammunition. The existing cartridge rim precludes the use of clips or chargers as used in foreign rifles. The Harris magazine is designed to meet this difficulty. A box fits into the stock below the receiver, not projecting below the woodwork, and containing 6 cartridges, which can be introduced singly or together, with great rapidity, from above on to a metal corrugated platform, which is at once sunk on pressing a thumb-lever with the left hand, holding the fore-end of the rifle. The cartridges then, on falling with the platform, automatically arrange themselves above one another in two rows in parallel zigzag order. The action is simple and does not interfere with the "cut-off," so that the rifle can be used as a single-loader while containing 6 rounds in the magazine, which can be unloaded by pressing the lever with the left thumb and turning the rifle over, when they will fall out into the right hand.

It seems probable that the Harris magazine may be adopted, for all the reports of it are most favourable. An improved Lee-Enfield rifle has

also been experimented with, which is 3 inches shorter than the regulation rifle and higher in proportion. It has the Harris magazine and the Ross straight-pull.*

The advantage of the straight pull is that there are only two motions required in loading, and that the upper arm and right elbow of the firer is less exposed when loading in the prone position.

The Australian "Hylard" Magazine Rifle and Bandolier have also been tried.

In England they are not satisfied with their cordite powder, the excessive heat generated by the nitro-glycerin eating away the bore and using up the barrel too quickly. In the experiments, the German Rottweil guncotton powder seems to have come off victorious, but many voices were raised against its introduction, so the question is still in abeyance.

A Mr. H. Gabbett-Fairfax has invented a new automatic Pistol called the "Mars," which, with its ammunition, is manufactured entirely in England. It is made in 3 calibres, a comparison of which with the Service Revolver Ammunition is as follows:—

Calibre.	Weight of Bullet.	Charge.	Muzzle Energy.	Length of Pistol.	Weight of Pistol.
Service Revolver ..	265 grs	18 gr. (black)	287 ft.-lbs.	11·5-inch	—
11·3 mm. Mars Pistol = ·45in.	363 „	12 „ (cordite)	760 „		
9 „ „ „ = ·36in.	160 „	12 „ „	960 „		
8·5 „ „ „ = ·33in.	140 „	10 „ „	950 „		
Mauser Pistol .. = ·30in	85 „	7·75 „ „			

* The Ross rifle, designed by Sir Charles Ross, Bart., has been adopted by the Canadian Government for the armament of the Dominion troops, and is under consideration by the Commonwealth of Australia also.

Its length, without bayonet, is 4 feet, or with, 4 feet 8½ inches.

„ weight „ „ „ $7\frac{9}{16}$ lbs. „ 8¼ lbs.

Like the Harris, its magazine is flush with the wood, without projection, and is of the same class, but contains only 5 rounds, which are received into it by lowering the metal platform in like manner. It claims to be simpler, as there are fewer parts. It has a "cut-off," worked by a slide on the right side of the breech-shoe. As in loading the magazine singly by hand quickly, some cartridges are apt to fall outside instead of into the breech, a carrier or loading case of cardboard or thin tin is supplied, containing 5 cartridges, which is covered with a thin tape lightly fastened on. This is stripped off at the moment of loading, and the cartridges tipped over into the top of the magazine, being lowered into it as above. The bolt is a front-lock straight-pull, one movement unlocking or locking, and cocking the firing pin, and it has a strong extractor. Its rate of fire is about 20 rounds per minute. It is a handy light rifle coming easily up to the shoulder. It has been well tested in every way; whether it is quite as strong as the Lee-Enfield is a moot point.—E. G.

The magazine of this pistol is contained in the stock in the form of a slide inserted from below. The special feature of this pistol is that the breech-block and barrel recoil together throughout the whole length of backward travel. It is said to be able to fire 180 rounds a minute.

A quantity of Mauser rifles and ammunition captured in the Boer War is to be sent to India wherewith to arm the Frontier Militia, Police, etc.

The establishment of a Small Arms Factory near Calcutta, which is to be in working order in two years, will much increase India's defensive strength.

Italy.—The Infantry and Mobile Militia are armed with the Mannlicher Carcano Rifle of 1891-2. 6·5 mm. (·256 inch), the Cavalry with Carbines of this pattern. Experiments have been made with two new rifles, the Cei Rifle of 1901 and the Freddi of 1900. The latter is said to be of very simple construction.

Japan.—The whole of the Infantry is now armed with the 6·5 mm. (·256-inch) Meidgi 30 Rifle designed by General Arisaka in 1897. The Japanese officers favour the Mauser system with clip loaders.

Portugal.—The Active Infantry and 1st Ban of the Reserve are armed with the ·256-inch Mannlicher Rifle of 1900.

Roumania.—The Roumanian Forces are armed with the ·256-inch Mannlicher of '93.

Russia.—The Active Army and 1st Reserve Troops are all armed with the three-lined rifle of '91, calibre 7·62 mm. (·299 inch). The Cavalry have the Cossack-carbine of '96. The Militia still retain the old Berdan of 11 mm. (·433 inch). According to the *Siècle*, a new rifle is being tried in Russia, which possesses all the virtues of the Mannlicher and is far superior to the Mauser.

Switzerland.—The Swiss Army has the 7·5 mm. (·295 inch) (Schmidt-Rubin) of '89-'96, and the Position Artillery Fortress Troops, telegraph and balloon companies, cyclists, etc., have been supplied with the 7·5-mm. short rifle, '89-1900. The officers carry a pistol, calibre 7·65 mm. (·301 inch), of the Borchardt-Laeger construction.

Some details of the above short rifle are as follows:—Calibre, 7·5 mm.; number of rounds in magazine, 6; weight of a round, 27·5 g. (423 grs.); charge, 1·9 g. (29¼ grs.), smokeless powder; initial velocity, 1902 f.s.

The Swiss authorities are now experimenting with a new Repeating Rifle, invented by a M. Fleury, of Aesch (near Basel), which, it is said, indicates by its construction a complete revolution in the mechanism of Repeating rifles.

Turkey.—The cadres of the European Army Corps (1st, 2nd, and 3rd) are supplied with 7·65 mm. (·301-inch) Mauser of '90; the 4th Corps in Asia Minor has the 9·5 mm. (·374-inch) Mauser Magazine rifle; the other four Corps in Bagdad, Tripolis, Yemen, etc., still have the Martini-Henry and Peabody rifles.

The manufacture of the 7·65 mm. Mauser and of its ammunition is now actually proceeding in Turkey, and the Imperial Factory near Constantinople can now, it is said, turn out 100,000 cartridges daily.

The United States of N. America.—The land forces are armed with the 7·62 mm. (·299 inch) Krag-Jörgensen of '92, the Navy with the Lee straight-pull of '93, calibre 6 mm. (·236 inch). Experiments are being made with a rifle which is a sort of combination of the Mauser and Krag-Jörgensen systems. This is said to give to its bullet a muzzle velocity of 2300 f.s. Trials are also being made with telescopic sights for rifles. Trials are being carried on with the Parabellum self-loading pistols which can fire over 100 shots a minute with great accuracy. Of course the American manufacturers are much against its introduction, but it will probably soon be made in America on a royalty.

The Boers in the Transvaal and Orange State were chiefly armed with the 7 mm. Mauser of '93 (·276 inch), and also with the captured Lee-Metford, etc., rifles. They had several Mauser pistols. Very few used telescopic sights as reported, only their natural and highly trained powers of vision are so great that they can distinguish men from animals at immense distances, and the least dust movement on the horizon is a sufficient indication to them.

The tactical effect of the magazine rifle of small calibre is thus summed up by Captain Fossart in the *Revue d'Artillerie* for October, 1901:—

1. The number of men killed and placed *hors de combat* is about the same as before.
2. The wounds inflicted being slighter and more quickly recovered from, the number of men disabled throughout the whole campaign is rather less.
3. The moral effect of the wounds on the men is less.
4. It is necessary for Infantry to commence firing at approaching Cavalry at a greater distance than formerly, otherwise wounded horses will still gallop forward and break through their ranks, though they may after that succumb.

Owing to the far-reaching effect of the light flat trajectory bullets, it is difficult to give the wounded much assistance from the Bearer Companies while under fire.

Artillery Matériel in 1901.

General.—The Q.F. field gun is still the burning question of the day, "The Battle of the Modern Field Gun," as it is aptly termed in an able anonymous pamphlet bearing that title. Last year we indicated that the main question to be debated was: should the whole gun-carriage recoil, or should only the gun-barrel itself recoil axially in the cradle on its carriage? We might almost affirm that this question is now decided in favour of the latter principle. The main point lies in the easier adaptation of steel shells to the gun that recoils on its carriage. This will give confidence to the gun detachment, and quick firing will result from the recoiling-barrel system. If we enter the fight without shells and the enemy carries them, it is as if one fenced with the upper body naked against an opponent swathed in padding, arm-protecting bandages, etc. The men on the ammunition wagons must be similarly protected. (See the Report under France.) It is certain that no State will introduce recoiling gun *carriages* until the recoiling-barrel system has been well tried.

The Field-Howitzer question has not been decided by any country but Germany. It seems, as far as one can foresee, that where those of two different calibres cannot be taken into the field, one of medium calibre will be chosen.

Quick-firing fortress and siege guns have made more progress. (See under Germany.) For the direct fire of fortress guns armoured gun emplacements will be used, and in course of time armoured guns fighting will become a special branch of the Garrison Artillery duties.

Artillery Matériel in Individual States.*

Austria-Hungary.—At present the actual field guns in use are the converted 9 cm. (3·54-inch) of 90, and of 75 for the fixed batteries. The reports of General Thiele's improved steel-bronze guns are favourable. The Ehrhardt and the gun-recoiling Skoda quick-firers were also tried in the presence of the Emperor:—

1. At 2,500 metres against a Field Battery scarcely visible in the open.
2. On the defensive repelling an Infantry close attack with case.
3. In attack against a line of skirmishers at 2,200 metres with shrapnel.
4. With quick-fire shrapnel against Infantry within 1,500 metres.
5. Against well-covered Infantry with high explosives (Ekrasit).

The results were considered quite satisfactory.

* Full details of recent Field Artillery matériel on the Continent are contained in Captain L. R. Kenyon's papers in Vol. XXVIII., R.A.I. Proceedings, 1901-2.—E. G.

The heavy Howitzers (5·9-inch) with Ekrasit gave wonderful results against fixed objects. Lighter Howitzers of 3·937-inch calibre are, however, considered necessary as well as these. It is probable that in the Budget for 1903 new Field Howitzers and mountain guns will be estimated for. The heavy fortress guns are being provided with telescopic sights.*

Belgium.—The Cockerill-Nordenfelt Q.F. guns have not proved successful.

France.—Our prophecy in regard to the French Q.F. field gun with its steadiness while firing and the cover given to the men serving the gun by its shields has, as regards its influence on foreign artillerists, proved correct. They will bear in mind these advantages when selecting their Q.F. field gun. The French provisional Artillery Drill for 1901 gives certain details of this gun, which were also published in *Engineering* on 18th October, 1901.

The calibre of this field gun is 75 mm. (2·95 inch). Its weight is 370 kg. (7·283 cwt.), and its whole length 33 calibres (8·11 feet). Colonel Deport, the constructor of the gun, states in his report that he was the first really to verify the system of the axial recoil of the gun barrel on its carriage, and to devise a light gun, which is practically immovable in horizontal fire, and which will fire 20 rounds a minute, the weight of the shell being 13·9 lbs., and the muzzle velocity about 1,837 foot-seconds. A hydro-pneumatic break ensures the steadiness of the gun and carriage when firing, which is further secured by a spade under each wheel and one at the trail. The wheels of the gun carriage and limber are about 4½ feet in diameter. Some common shell as well as shrapnel are carried. The limber carries 24 shells and 3 men. The ammunition wagon carries 72 shells and 3 men. The total weight of the gun and limber is about 35½ cwt. The short 15·5-cm. (6·1-inch) guns and, according to report, some 22-cm. (8·7-inch) mortars form part of the heavy Field Army Artillery.

Germany.—The German Empire has armed its Artillery with two kinds of guns. The Field Gun of '96 and the 10·5-cm. (4·1-inch) Light Field Howitzer of '98. The former is intended for direct fire, but the latter can also use this, though primarily intended for high-angle fire. The heavy (5·9-inch) Howitzer of the Garrison Artillery are used as special Field and Position guns for heavy high-angle fire against entrenched positions from concealed emplacements, and they are not as a rule attached to the Divisions as the Light Field Howitzers are.

* The writer does not mention the interesting fact noticed in Major Nicholls' Prize Essay that some 9·45-inch Howitzers made by Skoda of Pilsen, in Bohemia, were sent out to South Africa by the British Government.—E. G.

General von Hoffbauer, formerly Inspector-General of Field Artillery, entered into a discussion regarding these in a pamphlet published in Berlin in 1901.

Krupp's new gun-barrel recoiling field-piece has been much approved of. Its barrel recoils in its steel cradle with the break cylinder attached. It has steel shields and (with these) weighs, when ready for firing, 19 cwt., and with limber about 34½ cwt. It fires 24 rounds a minute. The simplicity of all its parts, and its having only one spade attachment, are great advantages.

When the China expedition took place it was necessary to include mountain guns in the German Artillery system. Two 7-cm. (2·75-inch) Batteries were purchased from Krupp in Hong-Kong, and handed over to their detachments at Tientsin, and they were carried by American mules. They fired common shell and shrapnel, and stood the wear and tear very well. In future Mountain Batteries will form part of the Artillery establishment.

Great improvement has been made in the Garrison Artillery. As regards the use of heavy guns in the field greater stress is laid upon celerity in opening fire than in obtaining cover, but this latter must on no account be neglected as long as it does not delay the former. Cover for the detachments is first to be made, then for the guns. Sunken emplacements are generally used for heavy gun and mortar Batteries. Good observatories are of great importance. These are erected at the same time as cover for the guns is made.

The heavy Artillery of the Field Army, the siege trains, and the most important fortresses are armed with guns of the newest pattern, *i.e.*, the 5·9-inch Howitzer, the 21-cm. (8·3-inch) Mortar, the 10·5-cm. (4·13-inch) gun, and the long 15-cm. (5·9-inch) Ring gun. The latter is a quick-firer with hydro-pneumatic break. Its common shell weighs about 39 lbs., and its shrapnel about 39¼. The muzzle velocity of these is 1,923 foot-seconds,* and it has long-range penetration, great and bursting effect. Removable steel shields are affixed to protect the men serving the gun.

A heavy Howitzer Battery has 6 Howitzers, 12 ammunition wagons, 1 observatory wagon, provision field forge, etc.—total, 24 wagons. 4 Batteries form a Heavy Artillery Battalion.

The 21-cm. Mortar Battery has 4 mortars and 33 carriages (including observatory and mortar bed wagons). 2 Batteries form a Battalion. For the protection of the guns of defence, revolving armoured turrets and limber shields are carried. The former are armed with Q.F. guns.

* It is not stated whether nitro-glycerine or nitro-cellulose powder is used to produce the muzzle velocity given, which, of course, varies accordingly. The latter powder gives higher velocities, and I believe the Germans now use it.—E. G.

The heavier Q.F. guns carried by the Navy are at present 11-inch guns. Maxim machine guns are now regularly part of the service equipment. There are already 5 Machine Gun Batteries of 6 guns and 2 ammunition wagons each, and in October this year 7 more Batteries are to be added. They can be fired either from the travelling carriage or from a low kind of platform, the men lying down. These Batteries are attached to the Cavalry or Infantry Divisions, with some kept back with the reserve of the Army.

Great Britain.—The writer describes the Artillery of the British Forces and their armament, well known to our readers. He brings to notice the Prize Essay of Major E. G. Nicholls, R.A., in the *Royal Artillery Institution Journal*, giving the chief requirements of field guns deduced from the South African War experience as :—

1. A very light mobile Q.F. field gun for Horse Artillery.
2. A *Light* Field Howitzer for the Field Batteries.*
3. A mobile but effective Q.F. field gun for general purposes.
4. A Light Siege Howitzer carrying 80-lb. shell.
5. A Heavy Siege Howitzer carrying 250-lb. shell, but capable of movement with the train.

The Light Siege Howitzer should not weigh more than 3 tons behind the team.

Field Howitzers to range to 3,000 yards; Siege Howitzers to 10,000 yards; guns for Horse and Field Artillery to carry shrapnel only. Light Field Howitzers to carry half shrapnel and half common. Siege Howitzers to carry lyddite shells only. All to be capable of firing with high elevation.

The article in the *Monthly Review* by "Galeatus" is quoted by the writer, who says the spade arrangement for our field guns, designed by Sir Geo. Clarke, worked well in practice, and who pointed out the difficulties thrown by the Government in the way of private firms like Armstrong and Vickers-Maxim, which were quite capable of supplying the wants of the Army if reasonably treated. He says the fact of our having 16 different kinds of guns, Howitzers and machine guns in the late war is a proof of our unreadiness for war, and quotes Wille, who says that in no other Army are so many patterns of guns still in the Service. They amount to 154. Wille points out the mischief of this.**

* This officer and other Artillery officers of experience think our 5-inch Field Howitzer too heavy for mobility without shell-power sufficient to compensate for this.—E. G.

** The 5-inch medium (as now called) gun, weighing with its carriage 4½ tons, also did good service in South Africa from 3,000 to 8,000 yards range, but some Artillery officers prefer the Q.F. 4·7-inch gun as a useful medium gun for Heavy Batteries. It weighs 4 tons behind the team. Nine different types of field guns of British make are to be experimented with this year in England, so it is to be hoped that some decision will be come to, and this chaotic state of things remedied.—E. G.

Italy.—The new Italian field gun is the 75-mm. (2·75-inch) steel gun. The gun is 32 calibres (7 feet 4 inches), has 32 grooves, and weighs about 7 cwt. The total weight unlimbered is about 20 cwt., and with limber and ammunition about 34 cwt. Common shell as well as shrapnel are carried. The gun has the spade arrangement for checking the recoil on firing. Fuller details are given in the Report, for which we have not space. A new Field and Horse Artillery Drill Book has been provisionally issued.

The Netherlands.—At present the Horse and Field Artillery are armed with the 8·4 cm. (3·3-inch) Krupp gun. The Siege Artillery have guns of 8 cm. to 30·5 cm., and mortars of 10 cm. to 15 cm. In the summer of 1900 experiments were commenced with Q.F. field guns, a selection from which has not yet, however, been made.

Russia.—By an Imperial Decree of the 22nd May, 1901, the Tsar decided to arm the Field Artillery with the Q.F. 3-inch gun (Mark 1900), of which the drawings and details were laid before him. This is the pattern recommended by General Ingelhardt.* It is a barrel-recoiling gun with hydraulic brake with interrupted screw breech action, to the use of which the Russian Field Artillery are accustomed. The projectile is given a muzzle-velocity of 2,000 f.s., a new departure in Russia. The Heavy Artillery of the Field Army is to have the 10·67 cm. (4·2-inch) heavy gun. The Siege Artillery have a gun of like calibre, but of greater power. The siege train has also light and heavy 15·25-cm. (5·97-inch) guns, light 20·32-cm. (8-inch), 8·69-cm. (3·4-inch) mortars, 22·86-cm (9-inch) mortars, and 8-inch mortars.

Spain.—After various trials with St. Chamond, Vickers-Maxim, Schneider-Creusot, and Krupp guns and carriages, the Select Committee reported in favour of the St. Chamond carriage, and the Maxim-Nordenfelt breech action. The 7·5-cm. (2·95-inch) Maxim-Nordenfelt barrel-recoiling quick-firer was also tried with its 14-lb. shell. The final decision of the Committee is not yet known, but French sources state that the greater part of the orders for new guns is to be placed with the French firms, though the limbers and ammunition wagons are to be ordered from Krupp.

Sweden and Norway.—After the trials between the Cockerill-Nordenfelt Q.F. guns and the Krupp gun mounted on a spade-recoiling gun carriage had resulted in the selection of the latter, experiments were made with Ehrhardt,** Schneider, and Chamond guns. The two latter

* See extracts from the Report for 1900 in the JOURNAL for October, 1901.—E. G.

** These are similar to those purchased by the British Government during the South African war. They are fairly well spoken of. (See JOURNAL April, 1901, p. 465, and October 1901, p. 1213.)—E. G.

firms were excluded, because they could not bring the total weight of the gun and carriage down to 18½ cwt., the maximum allowed.

The Ehrhardt was to have made certain improvements demanded by the committee, but the firm did not do so. The trials were, therefore, confined to different patterns of Krupp guns. The carriage-recoiling gun with spade attachment fired 8·11 shots per gun per minute in battery against 7·4 rounds per minute by the barrel-recoiling gun.* It is not yet decided which system should be adopted, nor were all the results of the experiments published when our Report went to press.

Norway.—Trials were also made here with Ehrhardt and Schneider guns. The Ehrhardt gun was then decided on, though a number of improvements (chiefly in the carriage, the spade, etc.) were required by the committee. The improved Battery was to be ready by September, but meanwhile 21 Batteries of 6 guns each on this system with the Nordenfelt breech action were ordered by May, 1902. The improved trial Battery was delivered in November and experimented with.

Switzerland.—After a series of trials in the course of November, 1901, with Q.F. guns supplied by Krupp in Essen, Skoda in Pilsen, Schneider-Canet in Creusot, Cockerill-Nordenfelt in Senning, and (Ehrhardt) by the Rhine Metal and Machine Factory in Düsseldorf, the Select Committee of the Swiss Government reported in favour of ordering a battery of 4 barrel-recoiling Q.F. guns on the Krupp system with 2 ammunition wagons having all the latest improvements, to undergo searching trials in August, 1902, so as to decide whether these or the carriage recoiling, spade attachment gun shall be adopted. The former guns have been described under the heading Germany. This is a great triumph for Krupp, as in Switzerland many were in favour of the Schneider-Canet system, which is practically a copy of the new French Q.F. field gun. No decision has been come to about Field Howitzers.

Field Fortification and Engineering in 1901.

Captain Durset, of the French Army, proposes to alter the shape of shelter trenches to give effect to the principle that the easier the position of the soldier in firing the better he shoots, and as the kneeling position is so uncomfortable he would increase the breadth of the fore part of the trench, which is about 8 inches deep from 12 inches to 1 foot 8 inches, so as to facilitate the sitting position under cover of the parapet, which is 1 foot 4 inches high. The measurements are too small. Instead of 8 inches deep, the trench must be at least 1 foot 4 inches deep to rest the feet in

* This pattern gun slides back in its cradle on recoil, and has a telescopic trail, of which the inner tube is drawn out to full length when the gun is in firing position.—E. G.

while firing in the sitting position, and the seat should be 2 feet 3 inches below the top of the parapet to obtain proper cover. The profile of the French proposed trench ·45 cubic metre (about 16 cubic feet) is less than that given in the German Manual of Field Fortification, which is about 20 cubic feet and more. Field-firing experiments against intrenched positions carried out on the Veszprim ranges near Hajmasker in Austria confirmed previous experience that shrapnel shell was of little use against troops under good cover, but that common shell was effective. The weak point of all such practice is that the defenders do not fire. Were it arranged that they should do so, while the attacker is approaching the position and preparing the attack, the results might be different.

The Passage of Rivers.

Since the introduction of heavy field artillery, military bridges require to be made, as every Army will carry with it heavy position guns, although it is only in exceptional cases that it will have siege guns with it. Yet mobility is more than ever necessary. The bridge-train no longer fulfils the obligation of being able to bridge streams of the moderate width of 200 metres. Having regard to the increased strength of material necessary to carry heavy guns, the Corps bridge-train has been shortened to 120 metres. This can be increased to 150 metres if Captain Meyer's proposal to add one trestle wagon to each divisional bridge-train be followed. The Report here goes into details comparing the Austrian and Russian systems, which it says are unfavourable to the latter, the wagon boats being 50 centners (49 cwt.) against 42 centners (41 cwt.) of the Austrian and French wagon loads. Two four-horsed wagons should be substituted for the present one to six-horsed wagons. It is of the greatest importance that the commanders of the bridge-train units should be acquainted with the object and intentions of the commander of the forces, so that they may give him their technical aid to best advantage.

Cavalry have been much practised of late in swimming across rivers, for it will never do to allow a river like the Moselle to put a stop to the advance of Cavalry, as happened in 1870, because they had no means of crossing. But every man cannot be an expert swimmer, and it suffices if a certain number in every squadron are so instructed. The Infantry Regiment No. 125 practised crossing the Neckar in 1901 near Münster. For non-swimmers two stout ropes were passed across the river, here 30 metres wide, and secured on the left bank. The non-swimmers passed over these by four at a time, the swimmers pushed before them while swimming their kits fastened up in a bundle of tent canvas, their rifles being laid on the top. Each company took 20 minutes to cross. In England they use a new boat raft 18 feet long, divisible into four

sections, each weighing a little over 1 cwt. One mule carries two sections. When put together, each half of the apparatus can carry a field gun and limber.

Military Communications of the Present Day.

These may be considered under the two heads: (*a*) the transmission of intelligence; (*b*) the means of transport:—

(*a*). 1. Foot messengers.
2. Officers or men on bicycles, on horseback, in different kinds of carriages, or in balloons.
3. The field telegraph, wireless telegraphy, the cavalry light telegraph, telephone, etc.
4. Optical or sun telegraph light signals, etc.
5. Homing pigeons and war dogs.

(*b*). 1. The heavy train-wagon columns
2. Pack carriage
3. Motor carriages and wagons
} Running along roads.

4. Locomotive trains
5. Light railways and tramcars
} Running along rails.

6. Steam-ships.
7. Sailing-ships.
8. Towing-boats.

Germany is well provided in this way, but other nations have not been idle. The writer goes into details regarding each of these, which we have not space for. He gives some regarding bicycle messengers, which are of interest. Cyclists, he thinks, are preferable to horsemen on good roads, they can do 30 kilometres (18 miles) in an hour. The delay stations can be 30 miles apart.* They have, therefore, been provided in Germany. In France each general in command has 19 cyclists at his disposition, each Infantry Division 11, the Cavalry Divisions 7, each Infantry or Cavalry Brigade 2, the staff of an Infantry Regiment 4, each Infantry and Rifle Battalion 3, and each Cavalry Regiment 2. The technical units have also a proportion. As a rule, folding bicycles are used. It is a moot point if these are the best. They can hardly be as strong as rigid ones.

Motor Cars.—By the introduction during the last few years of light and very rapid *Motor Cars* the service of Reconnaissance and of keeping up quick communication between commanders and their troops has been much facilitated. The writer goes into details of the various kinds of motors, which we have not space for. They have been reported in the Journal from time to time. The heavy racing and roadster motors now

* These distances seem somewhat long. The proportion of cyclists allowed in Germany is not given.—E. G.

used for sporting purposes and carrying from 4 to 6 persons will play an important part in war, the writer says, especially for keeping up communication between detached bodies and the Head-Quarter Staff of Armies. They attain a speed of from 40 to 50 miles an hour, with a weight of 3 cwt. per H.P. He does not especially bring to notice any particular patterns of automobiles tried in 1901.

Balloons, other than captive, require, he thinks, too many favourable conditions to be of reliable service as yet for military purposes.

Pigeons.—These birds well trained attain a speed of 40 miles an hour, and can fly at a height of, on the average, 1,000 feet. Though liable to much hindrance from bad weather, birds of prey, etc., a fair proportion arrive, and they are useful when taken up in balloons and tossed. They will of course only fly straight home.*

The Optical Telegraph.—The immense use of this in war has been proved in the South African War.** As a strategic means of communication it is of an importance which must not be underrated, and the more difficult the situation, the greater the consequence of this method of telegraphing. The rapid way in which this method can be established by day and by night, and the distance to which it is effective (60 miles) and its simplicity, above all its being often the only means of communication between detached bodies of troops by sea and land, make it the surest and most rapid means of attaining the desired object. Its use by detached Cavalry, advanced guards, outposts, etc., and for innumerable purposes, is evident.

In battle its use is confined to short pre-arranged signals, but may be of great value in determining a timely use of reserves on a slacker resistance of the enemy being reported, etc.

The Mance Heliograph system is generally adopted by all nations. Powerful Fresnel lenses are used for lamp signalling, and many sources of light petroleum, acetylene, lime-light, etc., are used. The Morse Code is generally employed.

The training of the *personnel* of the Signalling Staff is of the highest importance. The greatest care must be taken with the early instruction, and the officers and men must be constantly exercised to keep in practice. It is necessary that the officers and non-commissioned officers in charge of signallers should be well practised in map-reading, in finding their way with chart and compass in unknown country, especially by night, and should have much self-confidence. The writer speculates upon what

* It will be regrettable if the training of homing pigeons for the British service is abandoned.—E. G.

** The writer is probably aware that this method of signalling has been in use in our Army for many years.—E. G.

would have happened in the 1866 and 1870 campaigns had the heliograph been available.

The Report states that particular attention has been paid to Army Signalling in the United States of North America. The Signalling Corps consists of 1 brigadier, 1 colonel, 1 lieut.-colonel, 4 majors or captains, 14 first lieutenants, 200 sergeants, 150 corporals, 400 privates. This costs $800,000 (£160,000).

It details the organisation of Signalling Companies, etc., in the British Army, with which our readers are well acquainted, and gives some account of the signalling arrangements in fortresses.

Steps have been taken in Germany since the first experiments with Professor Herz's ether waves to carry on progressive trials in the application of these and of the Marconi system to military purposes. It appears this can be advantageously used for connecting the Advanced Cavalry and the Divisions with the Corps Head Quarters. Further ahead than the former the Flash-Telegraph—as they call it—can hardly be used as yet, as the signallers are so liable to interruption by the enemy.

This system is also liable to electric and magnetic disturbances, as well as to the interference of cross-rays from similar apparatus. It cannot be reckoned on for a higher rate than 150 words an hour. As captive balloons are necessary to carry the apparatus up a sufficient height, this method of telegraphy has in Germany been handed over to the balloon sections.

The question of FREE BALLOONS, of course, depends upon the possibility of steering them. The solution of this problem can only be made by those thoroughly grounded in mathematical science and physics. Unfortunately, much of what is mere charlatanism has crept into the development of this question.

For the present the Captive Balloon, with good arrangements for conveying intelligence of what is seen from it, is the most reliable method of observation.

War Balloons.—The Report gives an interesting tabular statement of the organisation of War Balloon Sections, etc., in Austria, France, Germany, Great Britain, Italy, Spain, the United States, and in some of the smaller Armies, but there is not space to transcribe this. Some account was given of these in the JOURNAL for February, 1900, p. 161. Austria, France, and Russia seem to have made more additions to their balloon establishments than other foreign Powers since then.

MILITARY TRANSPORT.

"On the average about 10,360 tons per mile are required for an army of 100,000 men moving about 67 miles from its base." These and

other interesting and useful calculations are given in the excellent chapter on Transport. But, as this occupies twelve closely-printed pages, and as British officers have had more recent experience in various kinds of transport than those of any other Army, it is not thought necessary to reproduce it to the exclusion of other matter.

Contemporary Military History.

The historical section for 1901 comprises an interesting and complete account from the German point of view of the Boxer Rebellion and the expeditionary forces from 27th September, 1900, to the end of December, 1900. A sketch-map accompanies the Report, which, it is much to be regretted, cannot be epitomised here for want of space. A general account of the occurrences in Southern China adds to its interest. The contributor, Captain Loeffler, says the German nation has every reason to be satisfied with the part played by Germany in the China expedition and with its results.

An account of the Ashanti campaign in 1900 is also given, with a sketch-map, and every credit given to the leaders for their courage and determination.

Military Literature.— Space considerations forbid more than a passing glance at some of the works mentioned in the Report for 1901. The numerous works still published on the Franco-German War are perforce omitted, excepting:—

La Guerre de 1870-71, published by the Historical Section of the French General Staff (Paris) in 1901, described as not a history of the war, but a sort of military chronicle of events, with copies of the orders, field states, letters, and memoranda of the various commanders. This first part was reviewed in the Journal for June, 1902, p. 853.

La Bataille d'Adua. By Lieut.-Colonel Petetin. Paris.

Kriegsgeschichtliche Beispiele aus den Kriegen der neuesten Zeit (up to 1898). By Major H. Kunz. Berlin.

La Guerre au Transvaal. Vol. II. By Lieut.-Colonel Painvin and Captain Frocard. Paris.

Der Krieg in China. By General Paul von Schmidt. Berlin. The Report says that the English publications on the Boer war are too voluminous to be even mentioned. A list is given in the *Militär-litteratur-Zeitung* (*Wochenblatt*), Nos. 7 and 8 of 1901.

Meine Erlebnisse und Erfahrungen im Buren Kriege. By Count Sternberg. Berlin. The Report says the Count's narrative is influenced by his situation in regard to the British Head-Quarter Staff, Colonel Henderson, the Chief of Lord Roberts' Staff, having written a preface to his book when translated into English.*

Unter dem Rothen Kreuze im Buren Kriege. By Dr. Suter. Leipzig. Gives some interesting medical and other details. Dr. Suter, a Swiss Army surgeon, was with the Swiss ambulance in the war.

Besides the above mentioned, it may be well to name some of the books brought to notice in the Report and classified under their different branches, but there is no space available here to enumerate more than a very few.

INFANTRY TACTICS.—*The Tactics of To-day.* Major Callwell, R.A. Blackwood.

Militärische Betrachtungen über den Krieg in South Africa. Militär-Wochenblatt, Beiheft No. 8. A retired German artillery officer.

The Attack of Positions on High Ground. Militär-Wochenblatt Nos. 19-20. Lieut.-General Rhone.

The Co-operation of Artillery with Infantry. Lieut.-General Rohne. Mittler, Berlin.

Règlement sur l'Exercice de l'Infanterie, 1901. Ministère de la Guerre. Paris.

Das Exercir-Reglement für die K. K. Fusstruppen, 1901. Seidel & Sohn. Vienna.

Die taktische Verwendung, etc., der Deutschen, Oesterreichischen, Italienischen, Französischen und Preussischen Armeen. Von Regenspurski. Major Balck. Eisenschmidt. Berlin.

Les Principes de la Guerre Alpine. F. Simon, Capitaine d'état-major. Berger-Levrault. Paris, 1901.

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* This book was reviewed at length in the JOURNAL for February, 1901, p. 225. Count Sternberg was a correspondent with the Boer forces, and was taken prisoner before Paardeberg. He praised the British officers, by whom he was well treated; but as he was sent to England at once, and his book was published shortly after, it can hardly have been influenced as stated. Colonel Henderson, though on Lord Roberts' Staff, was not Chief of the Staff.—E. G.

CAVALRY TACTICS.—*Der Freiheitskampf Nord Americas und der Burenkrieg. Militär-Wochenblatt, Beiheft* No. 8.

Cavalry Scouts. United Service Magazine, September, 1901.

ARTILLERY.—*Englische Artilleriewirkungen im S. A. Kriege. Militär-Wochenblatt* No. 35.

Die Verwendung der Schnellfeuer Geschützen. Jahrbücher, October, 1901. Lieut.-General Rohne.

Die Pompoms im Transvaal Kriege. Neue Militärische Blätter, XVIII., p. 27.

SMALL ARMS.—*Das Inf. Gewehr der Zukunft. Allgemeine Schweitzer Militärische Zeitung* No. 29, 1901.

Les Armes à feu portatives de Guerre. Revue d'Artillerie, August, 1901.

ARTILLERY MATÉRIEL.—*Waffenlehre.* General R. Wille. 2nd Edition. Berlin, 1901.

Der Kampf um die moderne Feldgeschütze. Anonymous. Berlin, 1901.

Studie über Schnellfeuer Geschütze. General H. Rohne. Berlin, 1901.

Die Französische Feld-Artillerie. General H. Rohne. Berlin, 1901.

HISTORICAL, GENERAL, ETC.—*Militär-Lexicon (with short description of the Wars since 1618, with maps and plans, and a list of works bearing on the same).* Lieut.-Colonel Frobenius. Berlin, 1901. £25.

Studien über Kriegführung auf Grundlage des amerikanischen Secession-Krieges. Major Freiherr von Freytag-Loringhoven. Berlin, 1901.

Moltke's Vermächtniss. General von Schlichting. Berlin, 1901.

OBITUARY.

Colonel Heinrich von Löbell.—It is fitting that the name of the distinguished originator of these Reports should head the list of deceased men of mark, which this year is not a long one.

He was born at Bermberg in 1816, the son of a major in the Prussian service, who died in 1822. He obtained his commission in the Artillery from the Berlin Cadet School in 1833. His career was almost entirely devoted to study, to teaching, to science, and to literature. In 1848 he was appointed to the Artillery section of the War Office. He became captain in 1850. In 1852 he was appointed lecturer in the Artillery and Engineer School, and Member of the Ordnance Select Committee. He sat on several committees connected with the technical education of officers, and in the winter of 1862-3 was associated with von Moltke, who was Chief of the Staff on the Cadet Corps Commission, and in 1864 he was promoted full colonel in the Artillery. From '67 to '75 he was lecturer at the Staff College. He was appointed chief of the Schleswig Regiment of Artillery, and then retired in 1866. He was an extremely busy man, and only wrote one actual book, "The History of the Needle-Gun and its Rivals." But in 1866 he founded and edited the existing *Jahrbücher*, and contributed to many technical periodicals. As far back as 1851 he had contemplated the establishment for the military art of a periodical which should embrace all important changes and progress in the Armies of the chief European States, but it was not until Dr. Toeche, the head of the firm G. S. Mittler and Son, co-operated with him in the work, that the "Report" made its first appearance in 1875. He edited and conducted it till 1891, and it was chiefly to his zeal, industry, judgment, and never-failing courtesy to his collaborators that the publication owes its success. He also edited the *Militär-Wochenblatt* and *Litterär-Zeitung* from 1880 to 1889. He died at Pankow, a suburb of Berlin, on 18th October, 1901, aged 85.

Lieut.-General O. Baratieri. — This Italian officer, better known through his misfortune in Abyssinia at the battle of Adowa, in February, 1896, than from his earlier and more fortunate service, was born in November, 1841. He served under Garibaldi in 1860, and in 1866 in the Tyrol. After being military attaché to the Embassy at Berlin, he was sent in 1887, when a colonel, to Africa, where in 1891 he was appointed Governor. In 1893 the Dervishes invaded the country, and in 1894 the Mahdi advanced on Kassala. Baratieri defeated him and occupied Kassala and Adowa. In January, 1895, he repulsed the attacks of Ras Mangescha at Kawatit and dispersed his forces by a surprise at Smafé, and enlarged the Italian border. For this he was promoted lieut.-general over the heads of many officers. By February, 1896, Menelik had marshalled from 80,000 to 100,000 warriors to put a stop to his advance, whereas Baratieri could only muster from 14,000 to 15,000 men, though reinforcements amounting to 10,000 were on the way from Italy, some of which had already landed. The general had to decide whether to retreat, to join forces with these, or to fight a decisive battle with the troops he

had. Unhappily for him he chose the latter course, impelled thereto doubtless by the circumstances of the Prime Minister, Signor Crispi, who required a victory to maintain his position. His own ambition and regard for the bad moral effect of a retreat on his troops also influenced him. He did not intend to attack, but to take up a position where he could await events. But the enemy fell upon him with overwhelming odds before he could effect this, and surrounded his force, which was compelled, after heroic efforts, to retreat in disorder. He was recalled and replaced early in March, 1896, by General Baldissera. He was tried by court-martial in June, 1896, but acquitted. Yet so crushing was the opinion pronounced by the court in regard to his capacity and his measures that he had to retire. He published a vindication of his conduct in Erythrea in 1899, called "Memories of Africa from 1892 to 1896." He died at Sterzing in August, 1901.

Lieut.-General Basil Gras.—The designer of the Gras rifle was born at St. Amand in January, 1836, educated at the Polytechnic School, entered the Artillery as sub-lieutenant in 1858, became captain in '64, colonel in '82, brigadier-general in '88, and general of division in '94. He was through the campaigns of 1859 and 1870, but it was chiefly owing to his technical ability that he was distinguished. In 1864 he was appointed to the Small Arms Factory at Tulle. Then he was appointed instructor at the Châlons Normal School of Musketry. In 1874 his recommendations led to the substitution of the Gras rifle for the Chassepot, which lasted till 1886, when the Lebel rifle took its place. The chief changes he introduced in his rifle were in the breech, and the substitution of a metal cartridge for the old *papier-maché* one. He replaced by a sword-bayonet the old straight-thrust bayonet. He was head of the Small-Arms Factories from 1882 to 1891. Then, till 1894, he commanded the artillery of the 6th Army Corps. After this he was appointed Inspector of Artillery Factories and Member of the Ordnance Select Committee, of which in 1899 he became President. He died at Chablis in April, 1901.

THE DUKE OF WELLINGTON AND THE PUNJAUB CAMPAIGN.

[A COPY of the original letter written by the Duke of Wellington on this subject was sent by Lord Dalhousie to Sir John Hobhouse, President of the Board of Control. It is now amongst the Broughton Papers in the British Museum (Add. MS. 36476, ff. 366-371), and the Institution is indebted to Captain L. R. Kenyon, R.A., for its insertion in this JOURNAL. The Duke's letter was written before the battles of Chillianwallah and Goojerat, evidently just after the receipt of the somewhat unsatisfactory action at Ramnuggur on the Chenab, on 22nd November, 1849. The remarks of the Duke on the use of heavy guns with a field army are of special interest, on account of the value of these guns having been again brought forward in the recent war in South Africa. The literature of the time of the Sutlej campaign shows what a profound impression was made on our Indian Army by the use of heavy guns in the field by the Sikhs in the battle of Ferozeshur.]

Copy of letter from Field-Marshal the Duke of Wellington to the Earl of Dalhousie, Governor-General of India :—

"Stratfield Saye,

"January 22nd, 1849.

"My dear Lord,—I wrote to you on the 6th inst. a letter in which I communicated to you my observations on the first reports which I had received of the movements of the troops in the Punjaub.

"I received yesterday the communication of a letter from the commander-in-chief to my office, dated the 26th November; and two letters from yourself, dated December 5th and December 7th; and I have seen in the papers general accounts of the operations upon the Chenab, to which your letter of the 7th refers.

"The commander-in-chief, Lord Gough, laments the immense numbers of followers and baggage, as he states four persons for every fighting man in the ranks, by which every Indian army is attended.

"The complaint is not new, the evil has been felt and the complaint made by every British officer who has ever commanded a body of troops in the field in that part of the world. Armies require there as well as elsewhere to be supplied with ammunition and stores.

"The countries, the scene and seat of military operations, are extensive and but thinly populated in proportion to their extent and but little cultivated. There are but few if any great roads or even practicable communications, no navigable water communications excepting the lower parts of the Ganges and Indus. In these countries there is scarcely a large agricultural village which might afford the resources of provisions to an army, still less a commercial town which could supply that or any other resource.

"Those who command and direct the operations of armies in India must understand, therefore, that, after breaking up on their basis, they cannot expect to find anything which they have not carried with them, excepting the trees in the forests and the grass which grows wild on the ground. The scanty cultivation of the population may afford them some green forage in the season and some straw in the winter, but nothing else.

"Under these circumstances, every article of every description required for the Army, or for individuals attending it, must be carried up with it or brought up to it from well-placed and well-stored magazines with which the communication must be constant and in a state of inviolable security.

"This includes ammunition and military and ordnance stores of every description, provision for men and animals, the former for each description of troops, European and native, medical and hospital stores, etc., and tents.

"Notwithstanding that means must be provided to carry all this with the army, there is no part of the world in which it is so necessary to the success and even to the existence of the army that its means of equipment and of movement should be complete and perfect as it is in India, in which country, while nothing can be found on the ground, excepting the trees in the woods, grass on the ground, and water in the rivulets, it is absolutely necessary to be able to move the army with the utmost celerity; and there is found everywhere opposed to the British army a formidable body of light troops, always acting upon flanks and communications, which can be kept in check only by the most rapid movements.

"It is useless to complain of this state of things or to lament it. That which must be done is to take care that the army, and every part of it, is fully equipped with means of moving every article which can be required in the service before it quits its basis.

"It is much to be lamented that Lord Gough should have quitted Ferozepore till all parts of his army should have been fully equipped with the means of movement required.

"It appears that his Lordship thought it necessary to equip his army for this service with heavy artillery, to be employed not in sieges as is usual, but for his operations in the field. I don't doubt that he was right. The operations of the former war showed that the Sikhs were in the habit of using ordnance of the largest calibres in the defence of their field positions and in their battles in the field; and it might be advantageous and even necessary to be prepared with heavy artillery in field operations; Lord Gough must be right on this point; but he ought to have been prepared to move these heavy guns to a certainty, together with all the ammunition and stores required for them.

"In my former letter, I stated my opinion that the first object of all should have been the siege of Moultan; for which operation, I conclude that Lord Gough considered that he had made sufficient provision, not only of force, but of ordnance, ammunition, and stores.

"It appears to me that a great degree of eagerness existed to fight a battle in the field, and I stated the grounds on which I suggested that the army under Lord Gough's immediate command should be considered as the covering army of the siege, of which it should protect the operations in security, whilst it should protect the position of the troops in Lahore, that of the troops in the Tullunden Dooab, the passage of the river Beas and the British frontier of Sutlej.

"The late operations, referred to in the letters from Lord Gough and your Lordship above referred to, are not inconsistent with the opinions contained in my letter of the 6th inst.

"It would have been quite impossible for Lord Gough to leave Shere Sing unmolested in his position of the Chenab. If his Lordship had moved, the troops in Lahore must have been attacked.

"No design could be more consistent with principle than that calculated to remove Shere Sing from that position or to attack him if he should remain in it, or as might be most advantageous on his removal from it.

"This appears to have been more necessary as the Resident at Lahore represented that, as long as Shere Sing should remain in Rechna Dooab, between the Chenab and the Julum, no provisions could be procured.

"But there can be no stronger proof of the truth of what I have just written respecting the necessity of carrying on operations with armies well equipped with the means of movement than is afforded in the report of these operations.

"The first view of the enemy's position must have proved tc Lord Gough that he could not approach it without the aid of his heavy ordnance.

"The enemy posted on the Chenab must be attacked on his flanks; the river must be passed, an operation which could only be attempted by the marches and manœuvres of the army, which could not be attempted, as in fact the means of movement were insufficient and even provisions were not plentiful.

"I cannot pretend to criticize the operations which were carried on. They certainly had not the result intended. The enemy has been removed from his position on the Chenab, but he has not suffered the loss which all must have expected he would have suffered and which he must have suffered if the army under Lord Gough had been equipped so that it could move with its heavy artillery and be supplied with provisions.

"I write these reflections on these operations, which I think may be useful to you and to those acting under our Government.

"Ever, my dear Lord Dalhousie,

"Yours most sincerely,

"(Sd.) WELLINGTON."

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—H. S. H. Prince Louis of Battenberg, G.C.B., G.C.V.O., to be Commodore of the 2nd Class; W. de Salis to "Orion," for Mediterranean torpedo-boat destroyers; C. E. Madden to "Good Hope"; G. W. Russel to be Captain-Superintendent of Pembroke Dockyard; T. B. S. Adair to "Gladiator"; F. O. Pike to "Camperdown." Commanders—F. M. Walker to "Calypso"; J. H. Robertson to "Gleaner"; C. M. Nicholson to "Antelope."

Captain H. S. H. Prince Louis of Battenberg, G.C.B., G.C.V.O., has been temporarily appointed a Commodore of the 2nd Class, until a successor is appointed to Rear-Admiral Burges Watson, the late Second-in-Command of the Mediterranean Fleet, who succumbed at Malta Hospital on the 21st inst. to an attack of acute pneumonia; Prince Louis has hoisted his broad pennant on board the first-class battle-ship "Implacable," of which ship he has been in command since September of last year. Rear-Admiral G. Atkinson-Willes has transferred his flag from the first-class battle-ship "Resolution" to the first-class battle-ship "Empress of India," which now becomes the flag-ship of the Home Squadron. The second-class cruiser "Æolus" arrived at Queenstown on the 21st ult., where she will act as flag-ship for Rear-Admiral E. Jeffreys, Senior Officer on the coast of Ireland. The third-class cruiser "Calypso" commissioned at Devonport on the 3rd ult. as drill-ship for the newly constituted Naval Reserve in Newfoundland; she will proceed under her own steam, and will be dismantled and have her engines and boilers removed on arrival at her destination. The third-class cruiser "Psyche," lately relieved from the North American station, paid off at Devonport on the 6th ult.; she will be refitted for further service by contract. The first-class cruiser "Terrible" arrived at Plymouth from China on the 16th ult., and pays off at Portsmouth; on the same day the first-class cruiser "Hawke" arrived at Chatham with the relieved crew of the "Vulcan," "Boxer," "Bruiser," and "Foam" from the Mediterranean, and has paid off. The second-class cruiser "Isis" commissioned at Chatham on the 18th ult. as sea-going tender to the "Britannia," and after embarking the fourth-term cadets at Dartmouth has since left for a cruise to Gibraltar, the Canaries, etc., returning to England on the 1st December.

The Collision between a Destroyer and German Mail-Steamer.—The recent unfortunate collision between the German mail-steamer "Kron Prinz Wilhelm" and the torpedo-boat destroyer "Wizard" in Southampton water has not yet been adequately explained. It is stated that the "Wizard" was going at 12 knots an hour, and was overtaken by the mail-boat, which was travelling at a speed of 16 knots an hour; clearly a vessel of her large size would make great surface disturbance, which would be still more appreciable in shallow and confined waters; her wash would make the management difficult of a small and shallow-draught vessel that came within the area of disturbance. The case demands further inquiry, and the information in hand at present is insufficient to justify an absolute decision.

Steam Trials.—The new first-class armoured cruiser "King Alfred" completed her steam trials successfully last month. She was built, engined, armed, and armoured by

Messrs. Vickers, Sons & Maxim. Designed for a mean draught of 26 feet, she was below her stipulated load, having her guns, a large coal supply and other stores on board, and after her preliminary trial it was found that she drew 26 feet forward and 26 feet 11 inches aft. When she started on her official trials the steam in the 16 boilers employed was 220 lbs., and the revolutions were 70 starboard and 70·5 port, with a vacuum of 27·2 inches starboard and 26·4 inches port. The collective I.H.P. was 6,395, and the coal consumption was 1·76 lbs. per unit of power per hour. Four runs were made over the measured base in Chesil Reach, when the speed realised was 15·167 knots. The loss of water was 15 cwt. per hour. During the four runs on the measured course the revolutions were 72·26, and the mean I.H.P. was 6,743. When the ship started on her second trial at 30 hours four-fifths power, she drew 26 feet 3 inches forward and 26 feet 5 inches aft. She had 250 lbs. of steam in her boilers and the vacuum was : starboard 26·4 inches, and port 26 inches ; the revolutions being starboard 106·6, and port 106·8. The engines maintained a remarkably even power, the I.H.P. being starboard 11,316, and port 11,289, giving a collective I.H.P. of 22,605. The coal consumption worked out at 1·82 lbs. per unit of power per hour, and the loss of water was 1·65 tons per 1,000-I.H.P. per hour. The speed was 21·597 knots. After six runs on the short course in Chesil Reach the vessel proceeded westward, and made two runs over the 23-mile measured distance between Ram's Head and Dodman Point, when the speed was 21·98 knots, with a trifle over 22,500-I.H.P. At her 8 hours' full-speed run the ship did equally well. Leaving the anchorage at Spithead at 4 in the morning, she cruised down Channel, and at the close of the eight hours' steaming at full power it was found that the mean steam pressure in the boilers had been 283 lbs., while the vacuum at the starboard engine was 26·6 inches, and at the port engine 25·5 inches. The starboard engine, running at 118 revolutions, developed 15,170-H.P., and the port engine, making 119·6 revolutions, indicated 15,723-H.P., the collective power being 30,893-I.H.P. The mean of mean speeds on several runs over the Admiralty deep-sea course at Chesil Reach was 23·465 knots. The water expended during the trial was only 39 tons, so that altogether the results are very favourable. At the close of the eight hours' test, starting, reversing, and other engine trials, took place, as well as steering tests, all with good results. The draught forward and aft was 26 feet 1 inch. The speeds of the other three vessels of the same class, it may be noted, were :—"Leviathan," 23·23 ; and of both "Drake" and "Good Hope," 23·05 knots. As to coal consumption, the "King Alfred" has also done well, for after establishing the fact that she could steam from Portsmouth to Melbourne at 15 knots without recoaling, she ran her full-power 8 hours' trial on a coal consumption of 1·81 lbs. per unit of power per hour. The coal consumption of the "Good Hope" was 1·92 lbs., of the "Leviathan" 1·94 lbs., and of the "Drake" 1·83 lbs.

The first-class armoured cruiser "Drake" has completed the series of progressive trials with experimental propellers with marked success and is now the fastest large cruiser afloat. Three series were run on the measured mile in Stokes Bay and four on the deep-sea course in Chesil Reach. Each series comprised four runs—two with and two against the tide—and the following figures show the means of each series :—1,685-I.H.P., 9·52 knots speed ; 4,014-I.H.P., 13·06 knots ; 6,520-I.H.P., 15·41 knots ; 9,872-I.H.P., 17·93 knots ; 14,801-I.H.P., 20·03 knots ; 22,534-I.H.P., 22·16 knots ; 31,409-I.H.P., 24·11 knots. Her highest speed, with a 4-knot tide, was 24·96 knots. Throughout the trials she drew 26 feet 1½ inches forward and aft.

The first-class torpedo-gunboat "Niger," which has been fitted by Palmer's Shipbuilding Company, of Jarrow-on-Tyne, with new engines and boilers of the Reed

water-tube type, has also successfully completed her trials. At her 30 hours' coal-consumption trial, which was run at one-fifth of the maximum power, the results were as follows:—Draught of water forward 8 feet 9 inches, aft 10 feet 4½ inches; air pressure, ·3 inch; pressure of steam at boilers, 216 lbs.; ditto, at engines, 205 lbs.; vacuum, starboard 26·3 inches, port 26·7 inches; revolutions, starboard 229 per minute, port 232; mean pressure in cylinders, starboard high 31·7, intermediate 15·9, low 6·3; port high 30·1, intermediate 15·7, low 6·1; I.H.P., starboard high 187, intermediate 227, low 218—total 632; port high 180, intermediate 230, low 216—total 626; total I.H.P., starboard and port 1,258; coal consumption 1·71 lbs. per I.H.P. per hour; speed, 14·493 knots.

At her full-speed 3 hours' forced-draught trial the results were as follows:—Pressure of steam in boilers, 231 lbs.; ditto at engines, 219 lbs.; air pressure, 2·1 inches; vacuum, starboard 25·5 inches, port 25 inches; revolutions, starboard 376, port 378 per minute; mean pressure in cylinders, starboard high 98·1, intermediate 48·1, low 18·9, port high 99·6, intermediate 48·5, low 17·9; I.H.P., starboard high 954, intermediate 1,124, low 1,073—total 3,151; port high 970, intermediate 1,139, low 1,022—total 3,131; total starboard and port, 6,282-I.H.P (being 282 in excess of the power required by the specification); speed, 20·5 knots. The former engines of the "Niger" were of 3,500-I.H.P. and her maximum speed 18·7 knots.

Launches.—Two of the new "County" class of armoured cruisers were launched last month, the "Donegal" on the 4th ult., from the Fairfield Yard, Govan-on-Clyde, and the "Berwick" on the 20th ult., from the Beardmore Yard, also at Govan-on-Clyde. The dimensions of these vessels are:—Length between perpendiculars, 440 feet; beam, moulded, 66 feet; displacement, 9,800 tons; I.H.P., 22,000; boiler pressure, 300 lbs.; normal coal capacity, 800 tons; and speed, 23 knots. The vessels have side protection extending over a length of 350 feet from the stem to the armour bulkhead, the latter being 3 inches thick. The side armour is of specially hardened steel of three thicknesses—4½ inches, 3 inches, and 2 inches. The armament consists of two twin 6-inch guns in barbettes, one forward and one aft, four 6-inch guns on the upper deck, and four 6-inch guns on the main deck, two 6-inch guns in midship casemates on the main deck, eight 12-pounder 12-cwt. guns, and two 12-pounder 8-cwt. guns, with an auxiliary armament of three 3-pounder and eight Maxim guns. The engines of the vessel are being made by Messrs. Humphrys, Tennant & Co., London.—*Compiled from "Times" and other sources.*

FRANCE.—The following are the principal appointments which have been made: Rear-Admiral—L. J. Rivet to command of one of the Cruiser Divisions in the Atlantic Fleet. Capitaine de Vaisseau—H. L. Manceron to be Chief of the Staff to Vice-Admiral Pottier.—*Journal Officiel de la République Française.*

Vice-Admiral Pottier, the new Commander-in-Chief of the Mediterranean Fleet, hoisted his flag on the 1st inst. at Toulon on the first-class battle-ship "Saint Louis." His Chief of the Staff is Capitaine de Vaisseau Manceron, who is expected to be among the next promotions to rear-admiral, a promotion which will not, however, affect his tenure of his present appointment; while his flag-captain is Capitaine de Vaisseau J. M. Nény, who held the same appointment under the admiral during his recent command in China. Vice-Admiral Bienaimé took up his appointment as Maritime Prefect at Toulon on the 1st ult. in succession to Vice-Admiral de Beaumont. Rear-Admiral Rivet, who succeeds Rear-Admiral Servan, in command of what was formerly

the Atlantic Division, proceeds to Martinique, where he will hoist his flag on board the first-class cruiser "Tage"; his division is now attached to the newly constituted Atlantic Fleet.

The first-class armoured cruiser "Bruix," bearing the flag of Rear-Admiral Gourdon, with the third-class cruiser "Surcouf," arrived at Brest on the 12th ult. from Martinique, where they had been detached to render assistance after the eruption of Mont Pelée.

The Estimates for 1903.—The Mediterranean and Atlantic Fleets.—Under the provisions of the Budget for 1903 the following will be the constitution of the Mediterranean and Atlantic Fleets :—

Mediterranean Fleet.

First-class battle-ships, 6—"Saint Louis," "Charlemagne," "Gaulois," "Iéna," "Suffren," "Jauréguiberry."
First-class armoured cruisers, 3—"Amiral-Gueydon, "Chanzy," "Latouche-Tréville."
Second-class cruiser, 1—"Du Chayla."
Third-class cruisers, 2—"Galilée," "Linois."
Torpedo-boat destroyers, 7—Not yet settled.

The First Division of the fleet, which consists of the "Saint Louis" and her two sisters, is a perfectly homogeneous one; the Second Division is so far homogeneous that all three ships, which will eventually compose it, have a speed of 18 knots, but the "Jauréguiberry," which was launched nine years ago, is a vessel of quite a different type to the "Iéna" and "Suffren," carrying a much less heavy armament, and having her heavy guns mounted in the method now discarded in the new battle-ships, viz., one 12-inch gun in turret forward, and one similarly mounted aft; with a 10·8-inch gun in a barbette-turret on each beam; both the "Iéna" and "Suffren" carry four 12-inch guns in two turrets, one forward and one aft. The "Suffren" is to relieve the "Bouvet," which is practically a sister ship to the "Jauréguiberry," as she stands in need of repairs to her engines and boilers; but she is not yet completed and has still to go through her trials, so it may be some months yet before she is ready. In the Armoured Cruiser Division the "Amiral-Gueydon," when she is ready, will take the place of the "Pothuau," which will pass to the Reserve Division.

The Reserve Division will be composed as follows :—

First-class battle-ships, 5—"Masséna," "Bouvet," "Carnot," "Brennus," "Charles Martel."
Second-class battle-ship, 1—"Hoche."
First-class armoured cruisers, 2—"Pothuau," "Amiral-Charner."
Third-class cruiser, 1—"Lavoisier."
Torpedo-boat destroyer, 1—"Le Hire."

The five first-class battle-ships of the division form a fairly homogeneous squadron with a speed of from 17 to 18 knots. The "Hoche" is a much older ship, and has neither the protection, armament, sea-going qualities, nor speed of the other ships; she can probably do between 14 and 15.

The Atlantic Fleet.

This fleet will be composed as follows :—
First-class battle-ship, 1—"Formidable."
Second-class battle-ships, 3—"Courbet," "Dévastation," "Henri IV."
Coast-defence battle-ships, 2—"Bouvines," "Amiral-Tréhouart."

First-class armoured cruisers, 2—"Marseillaise," "Jeanne d'Arc."
First-class cruiser, 1—"Tage."
Second-class cruisers, 2—"D'Assas," "Davout."
Third-class cruisers, 2—"Tronde," "Surcouf."
Torpedo-boat destroyers, 4 or 6—Not yet settled.

Among the battle-ships only one, the "Henri IV.," is a new ship, and she is not yet ready for sea, and has still to get through her trials; both the "Courbet" and "Dévastation" were launched more than twenty years ago, and the "Formidable" more than seventeen; the "Henri IV." and "Dévastation" are replacing the two coast-defence battle-ships "Jemmapes" and "Valmy" in the squadron. Among the cruisers the "Jeanne d'Arc" and the "Marseillaise" are replacing the "Dupuy de Lôme" and "Bruix," both of which ships require new boilers and a complete overhaul, but neither of the two relief ships is yet through her trials; and in view of her continued breaks-down it is impossible to say when the "Jeanne d'Arc" will really be ready. Of the smaller cruisers the "Davout" takes the place of the "Suchet," a sister ship, and the "Tronde" that of the "D'Estrées," a newer and more efficient vessel than her relief.

From motives of economy a very important change, seriously affecting the efficiency of the Mediterranean Fleet, is to be carried into effect, the crews of all the ships during the six winter months, from the 1st October to 1st April, being placed on a reduced footing of two-thirds their proper complement. This has been done for several years past in the Northern Squadron, but the Active Squadron of the Mediterranean Fleet has always been kept fully manned all during the year. The *Yacht* disapproves strongly of the new order, maintaining that not only the Active Division of the Mediterranean Fleet, but also the Armoured Cruiser Division of the Northern Squadron, stationed at Brest, besides a division of six torpedo-boats of each of the *Défenses-Mobiles*, should always be kept fully manned with trained crews, ready to put to sea at the shortest notice.

Launches.—The new first-class battle-ship "République" was launched at Brest on the 4th ult. She is one of the new class of battle-ships of large dimensions, approved in the programme of 1900, and has been just a year on the stocks. Her dimensions are as follows:—Length, 435 feet; beam, 79 feet 6 inches; draught, 27 feet 6 inches aft on a displacement of 14,865 tons. She will have three sets of engines, developing 17,500-I.H.P., giving a speed of 18 knots, with water-tube boilers, which have not yet been ordered or the type settled. She will be protected by a complete water-line belt of hard steel, reaching 8 feet above the water-line, with a maximum thickness of 11·7-inches; above this belt again will be a thin one 2·8 inches thick, which will extend from the stem to just abaft the foremost turret, reaching to about 16 feet above the water-line. The transverse bulkheads will be 4-inch. Her armament will consist of four 12-inch guns in turrets, one forward and one aft, protected by 10·2-inch armour; eighteen 6·4-inch Q.F. guns, twelve of which will be in pairs in six turrets, two aft, two forward, and one on each beam, protected by 6-inch armour, and six in casemates, also protected by 6-inch armour, with twenty-six 3-pounder and two 1-pounder Q.F. guns; five torpedo-tubes, two of which will be submerged.

The "République" and her sisters, on account of their large displacement, mark a departure from previous battle-ships built in France, the largest hitherto constructed for the Navy being the "Suffren," which has a displacement of 12,730 tons. The "Dévastation," a ship similiar to the "République," is to be laid down on the now vacant slip.

The new first-class armoured cruiser "Kléber" was launched on the 20th ult. from the Chantiers de la Gironde at Bordeaux. Her dimensions are as

follows:—Length, 426 feet 6 inches; beam, 58 feet 4 inches; draught, 24 feet 4 inches, with a displacement of 7,735 tons. She is triple-screwed, and the engines are to develop 17,100-I.H.P., giving a speed of 21 knots, steam being provided by twenty water-tube boilers of the Niclausse type. Protection is afforded by an armour belt of hard steel, extending from the bow aft for 335 feet from 10 feet above to 4 feet below the water, which is 4 inches thick at top, tapering to 3·3 inches at the extremities, and to 1·5 inches at the lower edge. The armament consists of ten 6·4-inch Q.F. guns, two carried singly in turrets, one forward and one aft, protected by 4-inch armour, and the remaining eight in casemates, also protected by 4-inch armour; the four midship guns are sponsoned out to fire right ahead and right astern respectively, and the two after and two forward guns also fire from abeam to a line with the keel respectively. There are also ten 3-pounder and six 1-pounder Q.F. guns, with two above-water torpedo-discharges. Her coal supply is 800 tons of loose and 1,200 tons of briquettes, and she has a radius of action of 8,800 miles at 10 knots, and of 1,650 miles at full speed. The "Kléber" has been launched almost complete for sea, the armour, engines, and boilers all being in place, with the two turret guns, her funnels, and military masts. She has been commissioned with a reduced complement for her trials, which it was hoped would be commenced at once.

It is, however, reported now on good authority that the launch of the ship with all her heavy weights, armour, engines, boilers, etc., in place is likely to prove a very costly experiment, as the ship's hull shows every sign of being so seriously strained, that it is doubtful whether she will ever be really fit for service, unless she is practically reconstructed. It is stated that a miscalculation was made as to the state of the tide, and that the shores were knocked away too early, with the result that the ship was left hanging on the slip resting only on the launching cradles, her midships section being most inadequately supported by the few shores left in position.

Two more mishaps of a serious nature are also reported with regard to the two new first-class armoured cruisers "Marseillaise" and "Amiral-Gueydon," which had commenced their trials at Brest and Lorient respectively. At her last trial, with the engines making 114 revolutions, developing 14,000-I.H.P., the speed attained by the "Gueydon" was 18 knots; both engines and boilers worked unsatisfactorily, while, as was the case in the "Jeanne d'Arc" and "Châteaurenault," the vibration was excessive, and when turning with the helm hard over the strain on the after part of the ship was so great that some of the plates were bent and rivets started to such an extent that a considerable amount of water found its way into one of the compartments; the ship has been docked and it is estimated that the repairs will take quite a month. Now the report comes from Brest that at the recent trial of the "Marseillaise," with the engines only developing 10,000-I.H.P., and the ship making 15 knots, in turning with the helm over about 20° the same thing has happened. All these mishaps would seem to show that the French constructors have carried lightness of hull to a dangerous extent, or else that there is something radically wrong in the workmanship both in the Government and private yards.

Trials of Submarines.—At Cherbourg the Coast-defence Battle-ship Squadron, consisting of the "Bouvines" (flag), "Valmy," "Amiral-Tréhouart," and "Jemmapes," put to sea under the command of Rear-Admiral Péphau on 10th September for combined manœuvres with the submarines stationed at that port. The idea consisted in driving off the blockading squadron by the submarines, the submersibles attacking from outside, and the submarines from inside the harbour.

The "Valmy" was torpedoed by the "Morse," and the "Français" was equally successful in torpedoing the "Bouvines." The following account of the latter attack

is given in the *Temps*:—"The presence of a battle-ship somewhere near her was made known to the 'Français' by the throbbing noise of the propellers; the submarine was at a depth of 6 metres (19 feet) at the time and fired her torpedo, which struck the battle-ship on the starboard side under the engine-room, the torpedo coming to the surface and showing its presence by the calcium light. Without loss of time the submarine then descended to a depth of 17 metres (55 feet) and passing under the battle-ship, torpedoed her a second time on the port side, and then rising to the surface made herself known to the 'Bouvines.' It was a bold manœuvre on the part of the 'Français,' accomplished with much skill and *sang-froid*."

These manœuvres with the submarines were continued again on 15th September. This time Cherbourg was supposed to be blockaded or protected by the submarines acting on the defensive, and the battle-ships had to try and force their way in. The former were again successful. The "Espadon" torpedoed the "Valmy" and "Jemmapes," and the latter was also torpedoed by the "Triton," and the "Bouvines" by the "Algérien," a sister boat to the "Français."

The results of these manœuvres seem to show that submarines when acting on the defensive are most effective, and that only in exceptional cases could a naval attack on a port succeed when properly defended by them. It is only on perceiving the periscope of a submarine that the enemy can be aware of their presence, the top of the periscope being not unlike a floating bottle in appearance. In one of the recent attacks the submarines hit on the idea of putting overboard a number of bottles in different positions, which had the desired effect of deceiving and puzzling the enemy and causing a great waste of ammunition. Up to the present no torpedoes have been actually fired by the submarines, their success in attacking a battle-ship being merely gauged by their position in regard to her on coming to the surface. They are now, however, to embark their practice torpedoes, and the exercises are to be continued on a more extensive scale, the boats taking on board eight days' provisions, and then proceeding to different points along the coast.—*Le Yacht* and *Le Temps*.

ITALY.—*Launch*.—The new first-class armoured cruiser "Francesco Ferruccio" was successfully launched on the 23rd April from the Royal Dockyard at Venice. She is a sister ship to the "Garibaldi" and "Varese" launched in 1899, and her dimensions are as follows:—Length, 344 feet; beam, 59 feet 9 inches, with a displacement of 7,350 tons on a draught of 23 feet 4 inches. The armour protection consists of a complete water-line belt of hard steel, 6 inches thick amidships, but tapering to 3 inches at the extremities, and rising amidships to the height of the upper deck, forming a central battery 150 feet long, shut in fore and aft by 5-inch armour bulkheads; the turrets for the heavy guns, one at each end of the central battery, are also protected by 6-inch armour, and there is an armour deck 1·5 inches thick. All the armour is of nickel steel, made at the Terni Works under a special system. The armament consists of a 10-inch gun in the fore turret, and two 8-inch guns in the after, with ten 6-inch Q.F. guns in the central battery, and four more on the superstructure deck, one at each corner of the battery; there are also sixteen small Q.F. guns and four submerged torpedo-tubes. The ship is twin-screwed, and the engines are to develop 13,500-I.H.P. at full speed, giving a speed of 20 knots, steam being provided by twenty-four water-tube boilers of the Niclausse type. The normal coal supply of the ship is 600 tons, but 1,200 tons can be carried.

The launch of the "Francesco Ferruccio" has given the Italian papers an opportunity for complaining of the small growth of the Navy:—"Such ceremonies as the launch of large ships now occur only too seldom," says *l'Italia Militare e Marina*,

"although in view of our extensive coast-line, mostly exposed to hostile attacks, there is every reason to have a naval force sufficiently strong to protect them. It is not so long ago since the Italian fleet held a high position among the Navies of the world, while we were able to look with pride and satisfaction upon such ships as the 'Duilio,' 'Dandolo,' 'Lepanto,' 'Italia,' etc., as fitting symbols of that sea-power which in times past was the breath of our life and our sovereignty. As the last testament of that great statesman, who took so prominent a part in shaping Italy's policy, there remains to us that study of maritime defence to which Crispi roused us, by which our fleet ceased to be merely a pious hope and a danger through its inadequacy.

Our financial position, the severe crisis through which we have been passing, but from which we are now beginning to raise ourselves, has re-acted heavily upon the fleet. Instead of the leading place, which we formerly occupied, as the pioneers in big battle-ship construction, we have had to resign ourselves to the necessity of economising—and what a difference there is now in less than twenty years!

Other nations have passed us, and from the first we have fallen to the last place! The blame lies with our politicians, who only saw salvation for the country in a balancing of the finances, instead of remembering that Italy would hold a much higher position among nations were she only respected and feared, even at the cost of some weight of debt."

The following is the list of ships building :—

Name.	Displacement, tons.	Where building.	Remarks, date of launch, etc.
Battle-ships.			
A	12,625	... ...	Not yet ordered.
B	12,625	... ...	,, ,,
C	12,625	... ...	,, ,,
Vittorio Emanuele	12,625	Government Yard, Spezia.	Not yet launched.
Regina Elena ...	12,625	Gov. Yard, Castellamare	,, ,,
Benedetto Brin ...	13,526	,, ,,	Launched, 7th Nov., 1901.
Regina Margherita	13,526	,, Spezia.	,, 30th May, 1901.
Armoured Cruiser.			
Francesco Ferruccio	7,400	,, Venice.	Launched.
Torpedo Cruiser.			
Coatit	1,313	,, Castellamare.	Trials in progress.
Torpedo-Boat Destroyers.			
Aquilone	360	C.T.T. Pattison, Naples.	Not yet launched.
Borea	360	,, ,, ,,	,, ,,
Meteoro	360	,, ,, ,,	,, ,,
Tuono	360	,, ,, ,,	,, ,,
Turbine	360	,, ,, ,,	Launched.
Nembo	360	,, ,, ,,	Lchd. practically complete.
Torpedo-Boats.			
X	—	... ...	Not yet ordered.
X	—	... ...	,, ,,
X	—	... ...	,, ,,
X	—	... ...	,, ,,
Submarine Boats.			
X	—	Gov. Yard, Spezia (?).	Building.
Auxiliary Ships.			
Collier	—	... ...	,,
Collier	—	... ...	,,
Supply Ship ...	—	... ...	Not yet ordered.

Steam Trials.—The new torpedo-boat destroyer "Nembo," launched last year from the yard of Messrs. Pattison at Naples, has completed her steam trials successfully. There are three others of the same class under construction, viz., the "Aquilone," "Borea," and "Turbine." Their dimensions are as follows:—Length between perpendiculars, 208 feet; beam, 19·6 feet; draught at full load, 6·33 feet forward and 7·5 feet aft; displacement, 330 tons. The hull is of steel plates, galvanised (*i.e.*, zinc-coated), and is divided into eleven water-tight compartments as follows:—Beginning forward, the first is the collision department, containing water tanks and chain lockers; second, forward crew compartment; third, compartment for firemen; fourth, forward boiler compartment; fifth, after boiler compartment; sixth, engine compartment; seventh, petty officers' quarters and dynamo room; eighth, officers' quarters; ninth, machinists'; tenth, after crew compartment; eleventh, store-room for provisions. The magazines and torpedo store-rooms are in the lower parts of some of the compartments mentioned. The armament consists of:—One 3-inch gun on a platform above the conning-tower with an arc of fire of 300°. Five 6-pounders: one aft, two each side. Two torpedo-tubes on central pivot mounts with arcs of train of about 90° on each side. The engines are twin-screw, 4-cylinder, triple-expansion, designed to develop 6,000-I.H.P., and give a speed of 30 knots; three Thornycroft water-tube boilers, furnishing steam at 213 lbs. per square inch. Coal capacity, 80 tons. She has completed her contract trials, and is now ready for service. With 80 tons of coal on board the displacement is 360 tons, but the trials were made with nearly all weights removed. On the progressive trials, the mean results of four runs over a measured base were:—Average time on course, 3 minutes 52 seconds; boiler pressure in lbs., 220; mean I.H.P., 5,346; mean speed, 30·038 knots; mean apparent slip of screws, 11·22 per cent. The mean draught on this trial was 5·43 feet, and the corresponding displacement 252 tons. The full-speed trials took place on 21st October under the following conditions:—Mean draught, 5·57 feet; corresponding displacement, 264 tons; duration of trial, three hours; boiler pressure about 200 lbs.; air-pressure in fire-rooms, 1·2 to 1·57 inches; mean I.H.P., 5,278; mean revolutions, 369·11; mean speed, 30·20 knots; mean apparent slip, 11·24 per cent. At the 6-hour coal-consumption trial the displacement was 266 tons, corresponding to a mean draught of 5·6 feet. The boiler pressure was about 200 lbs.; speed, 25·12 knots; revolutions, 311·24; I.H.P., 3,314; apparent slip, 12·44 per cent. The draught was forced, the air-pressure in the fire-rooms being equal to about 1 inch of water. The coal consumption was 66·54 lbs. per square foot of grate area per hour, and 1·95 lbs. per I.H.P. The performance of the machinery during the trials was satisfactory.

The ships of the Mediterranean Squadron had a recent speed trial, while on passage from Gaeta to Naples. The first-class battle-ship "Sicilia" averaged 19 knots, which is only three-tenths of a knot less than was obtained on her official trials, when first commissioned; the "Re Umberto," a sister ship, averaged only 18 knots. The speed of the other ships of the squadron is not given.

The "Turbine," a sister vessel to the "Nembo," has also completed her trials successfully. On the coal-consumption trial, with the engines developing 3,257-I.H.P., a speed of 25·2 knots was maintained for six hours, at a coal consumption of 0·889 kilogramme (1·95 lbs.) per I.H.P. per hour; the number of revolutions was 313, slip 12·6 per cent.; the pressure of steam at the boilers being 200 lbs., with an air pressure of 20 to 30 millimetres (·78 to 1·18 inches). At the three hours' forced-draught trial the engines developed 5,306-I.H.P., giving a speed of 30·1 knots, with 369 revolutions,

the slip being 11·3 per cent., the pressure of steam at the boilers was 205 lbs., and the air pressure 70 to 80 millimetres (2·75 to 3·14 inches).

The armoured cruiser "Carlo Alberto" has been making trials off Spezia, using for stoking purposes a mixture of coal and oil. Under natural draught a speed of 17 knots was easily maintained.

The new torpedo-aviso "Coatit" has begun her trials, but after an hour's run they had temporarily to be discontinued owing to the loss of a blade of one of her screws.

Discussion on Submarines in the Chamber.—A discussion on submarine-boats took place when the Naval Estimates for 1902-03 were before the Chamber of Deputies in June last, which shows that interest in this important question is growing. Two of the Deputies pointed out that in this matter Italy was being left behind, and in view of the improvements lately made in the kleptoscope, urged that the time had come for the Government to move in the matter. Admiral Bettolo, the predecessor in office of the present Minister of Marine, stated that having carefully followed the development of submarine boats, both in Italy and abroad, he was convinced that they would prove pre-eminently useful for a country like Italy. Still, he did not consider that in consequence of this development battle-ships had lost any part of their importance, but, on the contrary, they would continue in the future as in the past to form the mainstay of all fleets. In the admiral's opinion, the first duty of submarines in Italy would be to protect coast towns from a bombardment. The fleet itself had other duties to perform which did not lie within the province of submarines, and the country would require submersible boats as well as the submarine boats proper, and he hoped that all the questions connected with their proper use would soon be satisfactorily solved.

Admiral Morin, the Minister of Marine, replying on the discussion, said he was glad to be able to inform the Chamber that an eminent naval engineer, Laurenti, had devised a submarine boat, which seemed likely to give excellent results. He had recommended that the submarines for the fleet should be constructed in the Royal Dockyards, and not by private firms. He believed that their new boats would prove if not superior to, at least equal to, those possessed by other Powers.

New Fort at Tarento.—The new armour-plated turret, erected on San Paolo Island at the entrance to Tarento, is now completed. It has cost 12,000,000 lire (£480,000), and its total weight is 5,000 tons. It has been constructed under the superintendence of the military engineers; the machinery for revolving it has been supplied by the Armstrong Works at Pozzuoli, while the armour for the turret has been provided by Krupp. The two guns mounted in it have also been provided by Krupp; they are 41 feet 3 inches long, weigh 122 tons, and have a range of something over 18,000 yards. Each round costs 5,000 lire (£200). The projectile weighs a ton, is 4 feet 4 inches in height, with a diameter of 16 inches, while the charge will consist of 800 lbs. of a special powder, the prisms of which are six-sided, 1 inch high, ·8 of an inch in diameter and pierced in the centre. The turret is worked by hydraulic power by means of a lever placed in the centre of the platform between the two guns, where the commander of the turret will be stationed. The interior is lit by electricity. The projectiles are conveyed on rail, and the loading carried out by electricity, there being six boilers for working the dynamos, etc. The trials were carried out on several successive days and proved completely satisfactory.

Fleet Colliers.—The contract for the construction of the two new colliers for service with the fleet has been given to the Orlando firm of Leghorn, the price for each being fixed at 2,000,000 lire (£80,000). Their principal dimensions will be as follows:—Length between perpendiculars, 377 feet; beam, 45 feet 6 inches; displacement, 8,500 tons; with a draught of water of 23 feet, and a coal capacity of 6,000 tons. The triple-

expansion engines are to develop 2,500-I.H.P., giving a speed of 12 knots; the boilers will be of the ordinary cylindrical return type. When the ships are light they will carry 1,500 tons of water as ballast in two compartments, one forward and one aft, which will serve for supplying fresh water to the ships.—*Mittheilungen aus dem Gebiete des Seewesens, Marine Rundschau*, and *La Marine Française.*

UNITED STATES.—*Navy Construction and Repair.*—The annual report of the Chief of the Bureau of Construction and Repair of the Navy shows the increases in the estimates of money required for the Bureau for the fiscal year ending 30th June, 1903 :—

For salaries, an increase of $4,200, not to provide for an enlarged force, but to permit a transfer from the rolls to the civil establishment. For the construction and repair of vessels at navy yards and on foreign stations, the purchase of stores, materials, and machinery and the proper performance of general work in the line of construction and repair, an increase of $2,000,000. For hoisting apparatus needed at New York and Cavité, for two coal lighters for use at Mare Island, and for four tugs for general use at navy yards, $130,000.

The appropriation of $17,303,010 required for the Bureaus of Construction and Repair and Steam Engineering for the year ended 30th June, 1903, is the estimated amount required to be appropriated for work on new vessels authorised by Congress for "Increase of the Navy, construction and machinery."

Progress upon new vessels under construction has been delayed during the past fiscal year by strikes and by delays in the delivery of armour and steel forgings, so that all ships and torpedo-boats under construction are more or less behind their contract time of completion.

Owing to the fact that the capacity of the manufacturers of armour is insufficient to provide the amount of armour required for the five battle-ships of the "Virginia" class and the six armoured cruisers of the "Pennsylvania" class within the period allotted for their construction, there is a probability that the completion of those vessels will be delayed for two years. Under the present system of purchase of armour, the responsibility for such delays rests with the Government, and renders it liable to suits for damages. On this account, and because of economy, it is of importance that the delivery of armour should be adequate to the most prompt work.

The reports of the superintending naval constructors at the works of the various ship contractors show in detail the condition of each vessel under construction, including the repairs and alterations to vessels made at navy yards and stations.

The production of nickel steel for protective decks has kept pace with preceding years, and reached a total of about 5,130,000 lbs. The improvement in surface and in characteristics upon physical and ballistic tests have been fully maintained, and little difficulty is being experienced in procuring nickel steel of high characteristics in whatever quantity may be required.

The bureau recommends for construction six sailing vessels of about 1,900 tons displacement—two for the Pacific coast and four for the Atlantic coast—to be used in the training of apprentices and landsmen. The designs for these vessels, already submitted to the Department, are based upon those of the most successful sailing frigates. The estimated cost is $350,000 each, complete, except armament. The use of these vessels will prove not only the most efficient, but certainly the most economical method of training boys and men for the seaman branch of the enlisted force.

The report also recommends the construction of two small wooden sailing brigs to be used for exercise, one at the training station, Newport, R. I., and one at the training station, San Francisco, Cal., to cost $50,000 each.

The additional naval stations authorised and the completion of the new dry docks under construction will require four additional tugs.

Progress has been made toward the standardisation of ship fittings, and in this undertaking the bureau has had the co-operation of the shipbuilders.

Experience with vessels in commission fitted with fire-proofed wood, as well as the tests conducted by the bureau, showed that there was no practical advantage gained by the use of fireproofed deck planking, or by the use of fireproofed wood below protective decks, and also that owing to the absorptive qualities of this wood its use was objectionable in those locations. The use of fireproofed wood in the Navy has been dispensed with, except for such necessary joinery work as may be used above protective decks and on torpedo-boats.

By dispensing with the sheathing and coppering of three battle-ships of the "Virginia" class and three armoured cruisers of the "Pennsylvania" class a saving will be effected of about $1,000,000, and the durability of the vessels will be increased.

On account of strategical and economic considerations, it is necessary that the Navy should have a dry dock in the Philippines at the earliest possible moment. The maintenance of the Asiatic fleet requires the use of a dry dock under the control of the United States, and as the location and construction of a naval station in the Philippines, with suitable graving docks, is a matter necessarily involving considerable time, this bureau recommends the use for the present of a capacious floating dock, which can be utilised wherever it may be required. In view of emergency use in this connection, the Department purchased the floating dry dock in Havana, built in England for the Spanish Government. Examination shows this dock to be in very good order, and, within the limit of the sum appropriated by Congress for its purchase, it can be placed in condition for use up to its full capacity of docking vessels up to 10,000 tons displacement. For vessels of smaller size it has been in continuous use in Havana, and full information concerning it has already been submitted to the Department. It is recommended that this dock be sent at once to Olongapo, in Subig Bay, where it can be immediately used to great advantage.

The officers of the Corps of Naval Constructors are limited by law to forty in number. This number is inadequate to present needs, and should be increased. It is desirable that the regular process of recruiting the corps should be gradually continued by the yearly addition of two or three new appointments. It is recommended that Congress be asked to increase the limit of the corps from forty to sixty.

The work devolving upon the bureau's staff in the design of new vessels, the supervision of vessels under construction, and the administration of repair work, has taxed it to its utmost capacity under present conditions. These conditions have been aggravated by the lack of space in the Navy Department building.

The number of carpenters now afloat is barely adequate to the needs of the Service, and the number on shore duty is entirely inadequate for the necessities of this bureau. The bureau recommends that, as soon as the demands upon the time of naval constructors and chief carpenters will permit, a school for the instruction of carpenters' mates should be established.—*Army and Navy Journal.*

Gunnery Practice for the Navy.—According to the information received abroad from the various intelligence officers, foreign naval authorities are devoting an unusual amount of attention to the subject of target practice with big guns, and many ingenious schemes have been proposed for the increased usefulness of this form of drill. The idea in view is, of course, to simulate as nearly as possible the actual conditions existing in action, enabling the gunners to thus drill under service

conditions, but of course without the incentive of inflicting injury upon the enemy as the end in view. The United States Navy has never been behind in this matter of great gun practice ; in fact, it has been the boast of naval officers since we possessed a Navy that our systems have been copied by the rest of the world with advantage to themselves. As soon as the North Atlantic fleet arrives at Hampton Roads, Admiral Higginson will receive on the flag-ship, for distribution to the vessels of his squadron, instructions for a new system of gunnery practice prescribed by recent orders from the Navy Department.

This new system will replace the present sea practice, and when a ship shall have gone through with the new gun drill, and has had preliminary sea practice and four sea practices, her work in this line will hereafter be considered as complete. The entire drill will occupy the greater part of a month, and will include small arms target practice for all hands, sub-calibre practice with great guns, in which, at 500 yards, with the ship under way, ten shots will be fired at the target from each class of guns, and preliminary practice at 1,000 yards by guns of calibre ·45 and 1-pounders. The most important trial of great gun marksmanship and the one which hereafter will determine the fighting value of a ship will be known as "fighting efficiency practice." In this drill a target fashioned of spars and laid parallel with the water, and in all some 60 feet in length, will be employed. From this raft or target base will be erected miniature masts, 10 feet in height, rigged with canvas. The vessel will steam past this target at a range of about 2,000 yards, and, going at no less speed than 8 knots an hour, will fire each gun of her battery in turn at the target, bringing them all to bear during the run of about a mile past the target. Actual hits will alone be marked, and the ship's "fighting efficiency " will be rated by the percentage of hits out of the total shots fired.

To the older officers of our Navy this method will at once remind them of the system so long in vogue before and during the Civil War. With the ship in motion and sailing past the target at a moderate speed the gunners of the ship took turns in firing service charges at the target, and the actual hits marked the marksmanship of the gunner. In other words, the so-called new system is but a return to the old-fashioned and sensible method of testing the actual marksmanship of the gunners under conditions as closely simulating actual warfare as is practicable in times of peace. All of which calls to mind the theory that men's minds, given a proposition to solve and surrounded by a given set of circumstances, will evolve an answer similar to the solution reached by another brain similarly situated. "There is no new thing under the sun," and "All is vanity and vexation of spirit," says the Preacher.—*Army and Navy Journal.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR SEPTEMBER, 1902.

Field-Marshal H.R.H. A. W. P. A., Duke of Connaught and Strathearn, K.G., K.T., K.P., G.C.B., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., Scots Guards, Colonel-in-Chief 6th Dragoons, the Highland Light Infantry, and the Rifle Brigade (the Prince Consort's Own), Personal A.D.C. to the King, to be Colonel of the Army Service Corps.

Major-General the Hon. C. Y. Addington to be Colonel of the Devonshire Regiment. Major-General and Honorary Lieut.-General Sir W. Bellairs, K.C.M.G., C.B., to be Colonel of the Sherwood Foresters (Derbyshire Regiment). Major-General Sir J. D. P. French, K.C.B., Colonel 19th Hussars, to be Lieut.-General on the Staff to command the Ist Army Corps, and to be promoted accordingly.

SOUTH AFRICA.—*The Weapons used in the late War in South Africa.*—The following was contributed to the United States *Army and Navy Journal* by Joubert Reitz, late of the Boer Army:—

Many and many an article has been written discussing the advantages and disadvantages of topography and transport enjoyed and encountered by the two contending parties in the late war in South Africa, but never yet have the merits or demerits of the different armaments used in that war been discussed. This I consider the most important part, as the war has taught many lessons with regard to modern armaments, and would have been a liberal education to any foreign officer who could have been present to watch the operations. Tactics, of course, are also a most important point in warfare, but an Army which is armed with the latest and best weapons can make its strategical movements more effective than when it is using a weapon inferior to those of the enemy.

The first discovery made in the war was that side-arms are, to all intents and purposes, useless. In days of long ago, when armies charged at one another in close order, the sabre and the bayonet were of the greatest value, but nowadays, on account of the long range in the firearms and the difference in tactics, these weapons only become an impediment. It is true that occasionally one has an opportunity to use them, but these opportunities occur so seldom that it is waste of energy (since the soldier must not carry an ounce of unnecessary weight) to carry them. In all my experience of twenty months' active service I only once had the opportunity to use a bayonet or sabre, but the lack of these weapons did not inconvenience us in the least, as we found that the Mauser carbine was more effective and the fire so rapid that even a revolver was unnecessary. Even the British on this occasion, although they carried bayonets, preferred to use the rifle, and one soldier, although his bayonet was fixed, used his rifle as a club on one of the Boers. The Boer artillerymen and mounted police wore swords before the war, but the moment they had to go into active service they discarded them and took to the carbine, and even the British discarded them after the first few battles of the war. The British also discarded the lance, which is a useless and cumbersome weapon. Only on one occasion (at Elandslaagte, where they enjoyed "ten minutes' pigsticking") did they use it, and even then they did very little execution.

The best and only small arm which should be carried by the modern soldier is the magazine rifle. The revolver is also a good weapon for cavalry, but I think very much the same of it as did the German officer who said that the best way to use it was to throw it at the first enemy you met, for then you might hurt him and you rid yourself of an impediment at the same time. The Mauser automatic pistol is a very good weapon, firing ten rounds in succession, but on account of the smallness of its calibre it does not do much damage. Cases have been known where a man

had received five and six bullets through his limbs and body and still continued fighting. The Mauser revolver would be a very good weapon if one used expansive bullets.

There were three varieties of the magazine rifle used in the recent war, namely, the Mauser, the Krag-Jorgensen, and the Lee-Metford. This last is the British Army rifle, and before the war they boasted that they had the best small arm in the world. They have, however, since discovered that there are at least two which are better and which are superior to the Lee-Metford in every point. The Boers used the Mauser, but many of the foreigners used the Krag-Jorgensen, and many were the disputes as to which were superior. For my own part, I prefer the Mauser, on account of the simplicity of its mechanism and the rapidity of its fire. Those who used the Krag-Jorgensen profess that they can fire more rapidly with it than with the Mauser, but, although I have never seen it tested, I do not believe that it can be done, because the Mauser can be loaded faster than the Krag-Jorgensen, and it will, therefore, fire more rounds per minute than the other. With the Mauser one would never waste either time or ammunition, as the cartridges are arranged in clips which hold five rounds each, and it, therefore, takes no more time to load five than it does to load one, and one never takes more cartridges out of the belt than is necessary. With the Krag-Jorgensen it is different. The cartridges must be carried loose, and then one must either count the rounds first and waste time, or just grab a handful, when one is apt to take too many, and then time is wasted putting them back into the belt or the cartridges must be dropped and lost.

The Krag-Jorgensen, besides being slightly lighter, has a longer range than the Mauser, but this is of no importance, as a man is hardly discernible at a distance of 1,500 yards, and to fire at a longer range were waste of ammunition. A great advantage of the Mauser over the other two is that its ammunition is carried in belts over the shoulders, which is easier than the old-fashioned cartouch bag, from which ammunition is also very apt to get lost.

Concerning the Lee-Metford, I think it is a rifle which should be, and soon will be, condemned by the British Army. It is, I believe, the first magazine rifle invented, and must, therefore, necessarily be inferior to later inventions which have been adopted by two such Armies as those of the United States and the German Empire. The breech-lock of the Lee-Metford is constructed in such a way as to make it difficult for the soldier to take it to pieces for cleaning purposes should it clog. This is a most important point, as a rifle which is clogged is for the time being useless, and if it cannot be cleaned in a few minutes, is of no value to the soldier in an emergency. The magazine holds nine rounds, but should it be empty, the rifle can be fired no quicker than the old-fashioned Martini-Henry, as the loading of the Lee-Metford magazine is a tedious affair and the cartridges only go in one at a time.

There is, however, one great mistake about modern rifles, which is, that, on account of their very rapid fire, a man in a fight is very apt to waste his ammunition as he very often fires without taking steady aim, thus wasting ninety-nine out of a hundred bullets. It pays far better to fire less rapidly and aim well than to blaze away and do no execution.

Now we come to what I consider the principal weapon of modern warfare, namely, artillery. This king of weapons has played the most important part in the war in South Africa, and I think it will do so again in any war that might occur in the future. Napoleon once said that the man who could suddenly bring a masked battery into action would win the battle, and the truth of this has been proved at Colenso. There General Sir Redvers Buller knew that the hills were lined with Boers, but since (in accordance with an order given by Louis Botha) he could draw no response to his artillery bombardment the day before the battle, he did not know the number or the

positions of the Boer guns. Consequently when the Boers opened fire the next day upon the advancing infantry with two 6-inch siege guns and three batteries composed of Krupps, howitzers, Creusots, and Bom-Maxims, the British troops, who expected to meet hardly any resistance, were so demoralised that they made a most disorderly and precipitate retreat. I have often wondered, and it has surprised many besides myself, how it was that the British Army, supposed to be one of the best in the world, was so badly off in the matter of arms.

In the beginning of the war their armament consisted of howitzers, Armstrongs, and naval 4·7-inch guns, besides hand Maxims. At Nicholson Nek they even used muzzle-loading mountain pieces. Of these the howitzer is the best. It has a trajectory of nearly 45° at 400 yards, which causes the pellets and pieces of shell-case to fly down perpendicularly, in which case taking cover is useless. The British howitzer fired a 45-lb. shell and has a range of 4,500 yards, and is, I think, the best gun they had in the field.

The Armstrong is a very old pattern gun, and does not use a cartridge, which makes its operation very slow, besides having a range of only 4,500 yards. In a 4-foot trench one is always safe from this gun, but from a howitzer one is never safe. It will reach you anywhere except under a ledge or a bombproof over-head shelter.

Before the war a great many reports were circulated in South African papers concerning the effectiveness of lyddite. We were told that the British had a gun which fired a shell loaded with the new and terrible explosive called lyddite which would kill any living thing within 400 yards of the point of explosion. It appears, however, that it is no more dangerous than ordinary black powder. We were also told that the fumes and gas arising from the explosion would poison anyone that came within its reach, but this is not so, although it has a slight stupefying effect which is not at all dangerous, and may be prevented by sprinkling vinegar about the trench or on the clothing. The lyddite gas, however, dyes everything it comes into contact with, and it is not an uncommon thing to see men come from the trenches with their skins, hair, and clothing coloured yellow, green, or purple.

The lyddite shell, notwithstanding its tremendous explosive power, seldom does any real damage, on account of the construction of the shell. It is made of only a strong steel case, with no pellets in it. Could it be constructed on the same principle as the shell of the Krupp gun, which separates into regular triangular pieces of iron about the size of a marble and then filled with pellets, it would be a most dangerous implement. But this cannot be done, because the shell must be strong so as to give greater resistance. The greater the resistance the greater the force of the explosion. Therefore, if the strength of the case were lessened the explosion would not be so strong, and then one might as well use black powder.

It may be, and I am sure it is, an excellent weapon for bombarding forts and other work of that kind, but as a field piece it is useless, and has no more effect than the antiquated Armstrong. It is also a very cumbersome piece, as it needs either a traction engine or a span of thirty-six oxen to drag it. Its effectiveness can be seen from the fact that the British used it to bombard the positions of Colenso from the 16th December, 1899, till the 26th February, 1900, and never even hit a mule during all that time.

It was only after the occupation of Bloemfontein that the British used the Bom-Maxim, which is curious, as they considered it a very good gun, which it certainly is. Besides, it is manufactured in England by the Vickers-Maxim Company, which makes it almost incomprehensible that they should not have had them at the outset of the war. The pom-pom, as the Bom-Maxim is commonly called, is the most devilish invention of the times, not on account of the damage it does, but its moral effect is tremendous. It fires twenty-five 1-lb. shells in about 30 seconds, which scatter over

an area of about 100 square yards, and the shrill whistling of the shells and the noise of the explosions following so rapidly upon one another has a more demoralising effect than the fire from a battery of larger guns. The first time I was under fire from these screeching little shells, although I had splendid cover, I had great difficulty to restrain a tendency to take to my heels and run for all I was worth. Nevertheless, these guns, like all other Maxims, rarely do any real damage, as they seldom have the chance to fire into a company of men in close order. If they could do this the slaughter would be terrible, but, thank goodness, the chance seldom occurs.

The guns used principally by the Boers, besides the 6-inch Creusot siege gun, which fire a 96-lb. shell loaded with mélinite—a good siege gun, but too cumbersome to be used as a field piece—were the howitzer, Krupp and the Creusot 7-centimetre field piece. This is the first time the Creusot has been used in war, and on account of the experience gained thereby, the company which makes it will be able to place upon the market the best gun in the world for field work. It is light and the barrel lies very low in the carriage; in fact, the axle is constructed in such a way as to pass over and under the barrel. It is fitted with glycerine buffers to lessen the recoil, and the sights are nearly 18 inches to the right of the barrel, which allows for the deviation of the shell caused by its rotation, which is very necessary with a long-range gun. The Creusot has a range of 8,000 metres (about 8,500 yards), the longest range yet attained by so light and small calibred a gun.

Although an excellent gun, it has its faults, but they are not many. In the first place, the spring in the breech, which operates the nipple, is very fragile and apt to snap at any moment; and in the second place, the shell has not so great an effect as the Krupp. Could these little defects be righted, as, of course, they can be, the field-piece Creusot would be the best gun in the world.

Although the Krupp has a range of only 6,500 yards, many of our officers prefer it to the Creusot because the shell is more effective; but could the changes I mentioned be made in the latter, there would be no better gun than the Creusot for field work.

But yet the greatest advantage of the Creusot and the Krupp over the Armstrong is the fact that they use cartridges and the latter is loaded in the old-fashioned way—shell first and then the powder in the bag and a cap. I have often heard one of our artillery officers say that he could fire a shot with a Krupp or Creusot and have the second and third following it in the air before the first struck, a feat that would be impossible with a gun that loads like the Armstrong.

In many of the great battles of the war the British guns far outnumbered those of the Boers, but still they were able to hold their own, because they could throw a projectile twice as far as those of the British, and because, on account of the superior quality of the Boer guns, they could fire three shots to every one of the British guns. At Moddersprut the British had three batteries of Armstrongs and the Boers had four Creusots and two Krupps, but after a battle of seven hours the British had to retire into Ladysmith.

If the British take advantage of the lessons they learnt in this war, and I am afraid they are the only ones who will do so, they can in five years' time put an army in the field that will be able to fight almost any Army in the world, for, notwithstanding all that has been said about him, the British soldier is a brave man and a good fighter, and, were he armed with the latest and best arms, would be a dangerous foe to even the mighty Armies of Germany and Russia. It is a great pity that the foreign attachés did not remain in the field till the end, for then they could have seen and reported things, the knowledge of which would have been of inestimable value to the Armies of the world should a war occur in the near future.—*U.S. Army and Navy Journal.*

Return of Military Forces in South Africa, 1899–1902 :—

Strength of Garrison on 1st August, 1899. Reinforcements and Casualties, etc., up to 31st May, 1902.

	Officers, exclusive of staff.	Non-commissioned officers and men.					Total officers and men.
		Cavalry.	Artillery.	Infantry and Mounted Infantry.	Others.	Total.	
I. Garrison on 1st August, 1899	318	1,127	1,035	6,428	1,032	9,622	9,940
II. Reinforcements, 1st August, 1899, to 11th October, 1899 (outbreak of war)—							
(1.) From Home	280	...	743	5,620	...	6,363	6,643
(2.) From India (some of these did not reach South Africa until after the outbreak of hostilities)	259	1,564	653	3,427	...	5,644	5,903
	539	1,564	1,396	9,047	...	12,007	12,546
III. Further reinforcements from 11th October, 1899, to end July, 1900.							
Regulars—							
(1.) From Home and Colonies ...	5,748	11,003	14,145	110,292	14,347	149,787	155,535
(2.) From India	132	713	376	670	...	1,759	1,891
	5,880	11,716	14,521	110,962	14,347	151,546	157,426
Colonials—							
(1.) From Colonies other than South Africa	550	287	692	9,788	267	11,034	11,584
(2.) Raised in South Africa ...	1,387	...	...	...	...	28,932	30,319
	1,937	...	...	...	...	39,966	41,903
Militia	831	...	617	19,753	256	20,626	21,457
Imperial Yeomanry	536	...	...	...	...	10,195	10,731
Volunteers from United Kingdom ...	342	...	358	9,995	434	10,787	11,129
Total all arms sent to, and raised in South Africa, up to 1st August, 1900, including garrison on 1st August, 1899	10,383	...	...	...	...	254,749	265,132
IV. Further reinforcements from 1st August, 1900, to 30th April, 1901—							
Regulars—							
From Home and Colonies ...	1,157	5,427	1,129	12,588	2,686	21,850	22,987
Colonials—							
(1.) From Colonies other than South Africa	265	...	...	...	...	5,525	5,790
(2.) Raised in South Africa ...	937	...	...	...	...	21,158	22,095
Militia from Home and Colonies ...	116	...	...	3,823	...	3,823	3,939
Imperial Yeomanry	429	...	...	...	...	16,304	16,733
Volunteers from United Kingdom ...	164	...	...	...	...	5,641	5,805
South African Constabulary from United Kingdom	2	...	...	...	...	5,178	5,180
	13,453	...	...	...	...	334,208	347,661
V. Further reinforcements from 1st May, 1901, to 31st December, 1901.							
Regulars—							
From Home and Colonies ...	1,244	3,871	1,115	14,286	2,230	21,502	22,746
,, India	108	1,206	...	2,540	3	3,749	3,857
Colonials—							
(1) From Colonies other than South Africa	54	...	...	...	...	1,140	1,194
2) Raised in South Africa ...	numbers uncertain						
Militia	301	...	289	7,869	103	8,261	8,562
Imperial Yeomanry	44	...	...	...	...	877	921
Volunteers	14	...	...	...	...	393	407
Scottish Horse	7	...	...	...	...	447	454
South African Constabulary, from Home	13	...	...	...	...	1,696	1,709
South African Constabulary, from Canada	29	...	...	...	...	1,209	1,238
Total sent to, and raised in South Africa from 1st August, 1899, to 31st December, 1901, including garrison on 1st August, 1899	15,267					373,482	388,749

Strength of Garrison on 1st August, 1899. Reinforcements and Casualties, etc., up to 31st May, 1902—*continued.*

	Officers, exclusive of staff.	Non-commissioned officers and men.					Total officers and men.
		Cavalry.	Artillery.	Infantry and Mounted Infantry.	Others.	Total.	
VI. Further reinforcements from 1st January, 1902, to 31st May, 1902.							
Regulars—							
(1.) From Home and Colonies ...	777	2,047	1,294	13,502	2,640	19,483	20,260
(2.) From India...	69	...	...	6,496	13	6,509	6,578
Colonials—							
(1.) From Colonies other than South Africa	538	...	...	...	...	10,289	10,827
(2.) Raised in South Africa	numbers uncertain.						
Militia	443	...	...	11,156	...	11,165	11,608
Imperial Volunteers	384	...	...	...	...	6,751	7,135
Volunteers	69	...	...	...	...	2,446	2,515
Scottish Horse	8	...	...	...	...	371	379
South African Constabulary from Home	4	...	...	...	...	380	384
Total sent to and raised in South Africa from the 1st August, 1899, to 31st May, 1902, including garrison on 1st August, 1899	17,559	...	...	...	...	430,876	448,435

SUMMARY OF TABLES I—VI.

VII. Garrison on 1st August, 1899—		318	1,127	1,035	6,428	1,032	9,622	9,940
From Home	Regulars	9,206	22,348	18,426	156,288	21,903	218,965	228,171
	Militia	1,691	...	906	42,610	359	43,875	45,566
	Yeomanry...	1,393	...	...	...	...	34,127	35,520
	Scottish Horse	15	...	...	...	...	818	833
	Volunteers	589	...	...	...	...	19,267	19,856
	South African Constabulary ...	19	...	...	...	...	7,254	7,273
	Total from Home ...	12,913	...	...	...	...	324,306	337,219
From India	Regulars	568	3,483	1,029	13,133	16	17,661	18,229
	Volunteers	16	...	...	...	...	289	305
	Total from India ...	584	...	...	...	...	17,950	18,534
From Colonies	Colonial Contingents	1,391	...	...	...	...	27,699	29,090
	S.African Constabulary (Canada)	29	...	...	...	...	1,209	1,238
	Total from Colonies ...	1,420	...	...	...	...	28,908	30,328
	Raised in South Africa	*2,324	...	...	...	...	*50,090	*52,414
	Total	17,559	...	...	...	...	430,876	448,435

* These numbers are uncertain.

Strength of Garrison on 1st August, 1899. Reinforcements and Casualties, etc., up to 31st May, 1902—*continued*.

	Officers, exclusive of staff.	Non-commissioned officers and men.					Total officers and men.
		Cavalry.	Artillery.	Infantry and Mounted Infantry.	Others.	Total.	
VIII. Numbers—							
(1.) Killed to 31st May, 1902	518	...	...	...	...	5,256	5,774
(2.) Wounded to 31st May, 1902 ...	1,851	...	...	...	...	20,978	22,829
(3.) Died of wounds or disease, or accidentally killed in South Africa to 31st May, 1902... ...	554	...	...	...	...	15,614	16,168
(4.) Disbanded and discharged in South Africa	†377	...	...	...	...	†6,308	†6,685
(5.) In hospital in South Africa on completion of hostilities... ...	291	...	...	...	...	9,422	9,713
IX. Numbers left South Africa—							
(1.) For England, not invalids ...	4,075	...	...	...	...	64,456	68,531
(2.) For England, sick, wounded, and died on passage	3,116	...	...	...	...	72,314	75,430
(3.) For India direct from South Africa, including 2 Regiments of Cavalry, 6 Batteries Royal Field Artillery, and 3 Battalions of Infantry	275	...	...	...	...	9,859	10,134
(4.) For Colonies direct from South Africa—							
(*a*) Regulars, including 2 Battalions of Infantry to Ceylon and 1 Battalion to Bermuda, and 3 Companies Royal Garrison Artillery to Bermuda, 2 Companies to Mauritius, and 1 Company each to St. Helena and Gibraltar	169	...	...	...	...	3,409	3,578
(*b*.) 1 Battalion of Militia to St. Helena	10	...	...	...	...	379	389
(*c*.) Colonials	512	...	...	...	...	11,782	12,294
Total left South Africa ...	8,157					162,199	170,356

† These numbers are uncertain.

T. K. KENNY,
Adjutant-General.

29th August, 1902.

AUSTRIA-HUNGARY.—*Army Manœuvres.*—The *Neues Wiener Tagblatt* has published from day to day accounts of the Austro-Hungarian army manœuvres, which took place from September 12th to 16th in the neighbourhood of Sasvar, or Sassin, which is situated on the lower slopes of the Little Carpathians to the north-east of Vienna, and not far within the Hungarian frontier. The troops engaged were divided into a West and an East army. The former consisted of 57 battalions of infantry, 31¾ squadrons of cavalry, 92 guns, 4 pioneer companies, 5 bridge crews, and 1 balloon section; and the latter of 55 battalions of infantry, 36¾ squadrons of cavalry, 108 guns, 2 pioneer companies, half a bridge crew, and a balloon section. The independent cavalry division of each army consisted of 23¼ squadrons and 12 guns, which are included in the cavalry and guns given above. The total numbers were 80,058 foot, 14,846 horse, and 200 guns. The first day's manœuvres consisted in the main of a cavalry fight between the two cavalry divisions. On the second day the infantry marched some 15 miles before coming into contact. The East army concentrated the main portion of its force on a division of the West army, which division, though supported by a brigade which was sent to its assistance, was compelled to retire and take up a fresh position. The exact movements of the troops are only to be followed on a map of large scale, and no interesting details of attack and defence are given. Many of the men had been on the march for some weeks previous to the

manœuvres, and were in good condition. The third day was one of repose. The operations were renewed on the fourth day and ceased on the fifth day, September 16th, at 11 a.m. The troops were then so scattered that some of the commanding officers were very late in arriving at the central position, where the manœuvres were discussed. This was some eight or nine miles from the nearest station, whence the train conveyed the Austrian Emperor and his guest, the German Crown Prince, both of whom had followed the manœuvres, with the Chief officers back to Sasvar.—*Times.*

FRANCE.—*Army Manœuvres.*—The account of the French manœuvres of army corps against army corps, and later of the two army corps combined against an imaginary enemy, occupies many columns of the recent issues of the *France Militaire.* On 3rd September the 16th Army Corps, which was considerably short of its full war strength, marched upon Toulouse from Castelnaudary in a single column of some three miles in length. The French official map represents the country as level; but, as a matter of fact, it is very much broken up, and this makes it almost necessary for troops on the march to keep to the main road. On the same day the 17th Army Corps moved from Verfeil towards Villefranche de Lauragais in two columns in order to intercept the 16th Corps and force it back on Castelnaudary. The two columns of the 17th Corps were separated from each other on the average by three miles of broken country, which in the case of a flank attack would have made it difficult for one column to move to the support of the other. Fortunately, however, this attack did not occur, and it was the heads of the two columns which came in touch with the right flank of the opposing force. When this happened the artillery of both forces immediately moved to positions on high ground; the 61st Brigade, which protected the right flank of the 16th Corps, took up a position at Cessales, where it was attacked by the 34th Division, supported by the Colonial Brigade; the three brigades of cavalry and two of the batteries of horse artillery of the 17th Corps endeavoured to drive back the cavalry and horse artillery of the 16th Corps, and the engagement threatened to become general, when, just before midday, the cessation of operations was signalled from the balloon.

The men had been on the march, some since 2.30 and some since 3.30 a.m., and had covered more than 20 miles of ground; it was considered, therefore, not wise to tax them further. The previous manœuvres of division against division had weeded out the weaker men; but though the weather had been hot, not nearly so many men had fallen out as at the last year's manœuvres, largely owing to the greater consideration shown them on this occasion. In the proposed night operations, for instance, the regulation was made that only the troops designated should take part, leaving the others undisturbed; and that it would be sufficient in a night attack to surprise the outposts without interfering with the repose of the main body. In the event of the weather being cold the men on guard at night were to be allowed a fire, whether this gave information to the enemy or not. On 4th September the troops continued the operations of the previous day the 17th Corps advancing and the 16th withdrawing. It was noted that the infantry of the latter withdrew slowly in line as though on parade, seldom turning to fire and taking no cover; while the troops of the 17th Corps massed on the heights, where they offered a splendid target to the enemy's artillery some two miles distant. Operations ceased at 11.30 a.m. In the evening there was a heavy thunderstorm, which interrupted telegraphic communication with Paris, and produced on the roads a layer of marly mud. During the night the 61st Brigade, by surprising the outposts, retook from the Colonial Brigade the position at Cessales which it had lost during the day. On 5th September the Colonial Brigade was transferred to the 16th Corps, which then took the offensive.

It was part of the plan of General Pédoya, who was in command of the 16th Army Corps, to make a detour with the object of cutting the enemy off from its base, and in doing this he spread his force over a distance of 12 miles. His opponent, General Tisseyre, entrenched himself in a strong position in order to frustrate this movement. The chief incident of the day was the taking of the height, on which stands the mill of Tual, by a force consisting of six regiments of infantry and 60 field guns. General Picard, who was in command, received special praise from General Brugère for the way in which he handled the troops. In the final assault a gunner was killed by a gun being too hastily fired while he was still in front of it. His funeral took place the next day, which was one of repose for the troops, and was attended by General Brugère and all the troops who were at Villefranche. The Prince of the Asturias, who followed the manœuvres throughout, was also present. On the 7th, General Pédoya continued his attack. General Tisseyre, however, had deserted his position with his main body during the night, leaving four battalions to cover his movement. On discovering this General Pédoya followed him, marching in two columns, which, as in the case of the 17th Corps on the first day, were considered to be too wide apart. General Pédoya's plan developed prematurely, and, in consequence, his opponent was able to keep him at bay until the operations ceased. The Sunday crowd impeded the movements of the troops.

The object of General Brugère on September 8th and 9th was to bring the two army corps, of which he took command, into a position in which an engagement with an imaginary enemy, represented by a skeleton force, would be developed along his whole front. The first day was employed in manœuvring to get the troops into the desired position. On the 9th the assembled public expected to witness a grand advance along the whole line, with drums beating and cannon firing. But this was not to be, and the manœuvres abruptly terminated at 8.30 a.m. The crowd of spectators was so great and obtrusive that the correspondent of the *France Militaire* asks how would Marshal Soult have fought the battle of Toulouse under such conditions? ("Comment diable, avec tant de gens entre ses jambes, le Maréchal Soult eût-il pu livrer la bataille de Toulouse?") The correspondent of the *Patrie* endeavoured to get the opinion of the English military attaché on the manœuvres, and apparently received the information that the watchword of attack and defence should be "invisibility." With regard to this point, a French colonel stated that many commanders objected to their men taking cover, because they considered it would demoralise them. The troops dispersed on September 10th, on the evening of which day they had all departed.—*Times.*

GERMANY.—*Army Manœuvres.*—The annual manœuvres of the German Army, which took place between Frankfort-on-the-Oder and Posen, on 9th, 10th, 11th, and 12th September, were on a larger scale than ever before, and engaged more than 100,000 troops, including 28,000 cavalry. The operations extended over a territory about 30 miles wide and 50 miles long, the purpose being to test the feasibility of preventing an invasion from Russia across the Vistula River through Schleswig. The invading army, designed the Red, consisted of the 5th Corps and fractions of other corps of the German Army. It included 26,000 infantry, 17,000 cavalry, four regiments of field artillery, a complement of machine guns, war balloons, wireless telegraphy, and complete medical and commissary departments. The defending army, known as the blue, was made up of the 3rd Corps and the 1st Division of the Guards of the German Army. It included 28,000 infantry, 11,000 cavalry, five regiments of field artillery, and

a complement of machine guns, balloons, wireless telegraphy, and commissary and medical departments.

The actual manœuvres began on the morning of 9th September, and ended in the afternoon of 12th September, with an attack on the invaders by the defending army under the personal command of the Emperor, in which the invaders were utterly overwhelmed. The Emperor acted as umpire for both sides. The visiting officers, including Major-Generals Corbin and Young and Brigadier-General Wood, of the United States Army, were attached to the Reds, or Russians. The American officers wore the new drab fatigue uniform of our Army, which, among so many brilliant and highly-coloured foreign uniforms, was quite distinctive. The Emperor looked the American officers over closely and told General Corbin he thought their uniforms were sensible and in good taste. His Majesty took General Young with him on a trip inside the lines of the Blues, and his bearing toward the Americans in every way was most kind.

While these manœuvres, engaging more than a sixth of the entire German Army on a peace-footing, were tremendously spectacular and imposing, their real importance lies in the tests which they applied to the efficiency of the German military establishment as a whole. What results those tests produced are known only to the board of strategy of the general staff. Back of and underneath the visible operations of these large bodies of troops was the machinery of organisation, direction, and mobilisation of the German Army, and it was to test the strength and readiness of this machinery that the manœuvres were primarily intended. The chief value of the manœuvres, therefore, lies in a consideration which is only perceived by the board of strategists at the top of the general staff, while of foreign visitors not even those of the first rank were allowed to see the full meaning of the operations.

The most interesting and the most valuable feature of the German manœuvres, says Poultney Bigelow in the *Independent*, "is that which is not shown to the visiting stranger—the part that is played before the curtain is rung up, before a single battalion has marched to the front. I refer to the great German secret—'mobilisation' . . . . In Germany every cart, every horse, every cow, everything that can serve an army in the event of war, is carefully ticketed against the day when its services will be required. When the Emperor presses a certain button in Berlin every hamlet of the Fatherland feels the throb and responds with the alacrity which we associate with a fire alarm. Every man of fighting age knows just when to report. He finds his uniform and accoutrements ready for him; the horses and carts congregate as if by magic; the very cattle seem to have been trained to expect a glorious 'death by mobilisation.' It is in the early stages of the manœuvres that the military student sees what is most precious to him—it is just the thing which foreign military visitors are not invited to see."

Two striking innovations were observed during the manœuvres, namely, the use of wireless telegraphy and Boer field tactics. The results of the wireless experiments seem completely satisfactory. The system used was neither the Slaby nor the Marconi, and a description of the apparatus is not available, because visitors at the manœuvres, when they came close to the stations, were requested to retire. The exterior of the apparatus is simply a cubical iron box, about 3 feet each way, mounted on a wagon resembling a gun-carriage, and drawn by four horses. The messages sent were caught on a wire attached to a small balloon several hundred feet above the carriage. These stations were moved freely about the field, the horses sometimes going at full trot, but they were stopped for telegraphing. The operator used a key producing a shrill, metallic sound audible for 100 yards. The cavalry corps in making the detour kept constantly in touch with headquarters through the wireless telegraph, enabling the corps to hasten

or retard its movement throughout the 32 miles' ride, as, in the judgment of the head-quarters staff, changes in the situation were required. It will now be possible to deliver co-ordinate attacks by widely separated divisions in a way hitherto impossible.

Boer tactics were used extensively during the third day of the manœuvres, when the infantry deployed in open order and advanced regardless of regular formation, each man or squad taking advantage of irregularities of the ground for cover and running forward in small sections, instead of in a whole line, lying down again and once more advancing. The artillery also, instead of being massed on prominent points where guns and gunners would become targets for the enemy's guns, was placed in selected, covered locations, each battery taking up its position without regard to alignment with the others.—*U.S. Army and Navy Journal.*

RUSSIA.—*Army Manœuvres.*—The *Novoe Vremya* has published from day to day correspondence from each of the opposing forces in the Russian Army Manœuvres in the neighbourhood of Kursk. The Southern Army, under the command of General Kuropatkin, the Minister of War, began to assemble on 1st September, and on the eve of the manœuvres on 10th September it was encamped on the left bank of the river Reut some 25 miles to the south-west of Kursk. The Reut runs north-west into the Seim, which runs from east to west, passing south of Kursk. In a direct line to Kursk, therefore, the Southern Army would have to cross both rivers. The Moscow Army, under the command of the Grand Duke Sergius Alexandrovitch, began to assemble on 2nd September, and on the eve of the manœuvres it was encamped between the Southern Army and Kursk in the angle formed by the Seim and the Great Boritsa river, which joins it from the north. The Grand Duke Michael Nikolaievitch was umpire-in-chief. The Southern Army consisted of the 8th, 10th, and a mixed army corps, the 10th Cavalry Division, a mixed division of Cossacks, a squadron from the Elisabetgrad Academy, and artillery; in all 87½ battalions, 49 squadrons, and 216 guns. The Moscow Army consisted of the 13th, 17th, and a mixed army corps, a division and brigade of cavalry with a half squadron from the Tversk Academy, and artillery; making in all 75¾ battalions, 36½ squadrons, and 192 guns. In round numbers, the total number of troops present was 89,000; considerably less, therefore, than the 124,000 which assembled in 1890. The conditions are vastly altered since then; the travelling kitchens relieve the men of a great deal of labour, and add, perhaps, as much as 20 per cent. to the strength of an army: the telephone and telegraph have increased the means of communication; the cavalry have a special telephone command; the Southern Army was furnished with 140 miles of field cable, and the Moscow Army with 120 miles; both armies had an organised pigeon-post, and the cavalry and advanced guard carried pigeons in specially constructed boxes with them; each army was provided with a balloon section; motor-cars and motor wagons were largely in use. The greater part of the operations took place along the line of the river Seim, parallel to which ran the railway from Kursk, and the Moscow Army was supplied with bread from that town, three large ovens being in use day and night and producing 46 tons of bread per 24 hours. With regard to the manœuvres, both armies sent out reconnoitring parties, and took up positions on the evening of 10th September, so that a line of demarcation had to be made, and for some unknown reason a bridge thrown across the Seim by the Southern Army was apportioned to the Moscow Army. On the morning of the 11th, the Moscow Army, discovering that its opponent was two divisions short of its full strength, made a forced march to meet it, during which it crossed the Seim. On the 12th the Southern Army was attacked and driven from its positions, and com-

pelled to take up fresh ones. All positions where a stand was made were entrenched. Both armies were now on the south-west side of the Reut. On the 13th the Moscow Army discovered that the Southern Army had been reinforced by the missing divisions, and decided to retreat across the Reut and the Seim and take up a strong position to the north of this latter river. The Reut was recrossed. The 14th was a day of repose. On the 15th the Moscow Army recrossed the Seim, and was followed the same night by the Southern Army. The 13th Corps, forming part of the Moscow Army, had some difficulty in crossing, as the pioneers with the two bridges, which the corps was to have used in crossing went astray. On the morning of the 16th the Moscow Army had taken up a strong position in the form of a semi-oval, and there entrenched. The position was on high ground, and the Southern Army, also on high ground, faced it on all sides, and on the Moscow right it had 100 guns in position. Under cover of the fire of these guns infantry and cavalry advanced to the attack on the Moscow right and centre. Later the guns limbered up and moved round to the other side, and the infantry and cavalry attack began from that quarter also, and so became general. It was not long after this before foot and horse of both armies became intermingled, and the bugles sounded for the operations to cease. This ended the manœuvres.—*Times*.

CORRESPONDENCE.

A CRITICISM ON LIEUT.-COLONEL MAUDE'S LECTURE, "CONTINENTAL *versus* SOUTH AFRICAN TACTICS."

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—Lieut.-Colonel Maude's lecture on "Continental *v.* South African Tactics," in the March number of the R.U.S.I. JOURNAL, seeks to prove that the introduction of the small-bore and quick-loading rifle firing smokeless powder, necessitates no change in tactics. The lecture, to my mind, contains many fallacies and I propose to draw attention to some of them.

Lieut.-Colonel Maude begins by stating that "the papers have teemed with proposals and suggestions for the reform of our system of military training . . . contributed by . . . soldiers . . . all appear to start from the proposition that the fire of the magazine rifle has proved 'unprecedented.'" Surely, if this is the opinion of soldiers who have experienced modern rifle fire, an attempt to prove that this is not the case, made by a soldier who has never been under modern fire, or witnessed a rifle fight, should be supported by strong arguments. He further states "obviously it takes longer to get one's sights on to a target the size of a man at 1,000 than at 100 yards distance." It should, though, be remembered that the sight at long distances is not taken on individual men, but rather at a line of men, or at the position they are holding, etc., in which cases the rate of fire would be no slower than at short distances. It is the nature of the target rather than the distance that determines the time requisite to aim. Again, it is not only hits that produce effect in war. "Close misses" have their influence, too.

Lieut.-Colonel Maude can find no trace of experiments with regard to individual rate of fire to produce the maximum number of hits in a given time. Experiments in this direction are easy to carry out; but, as I have said, it is misleading to judge by hits only. Good shots with the L.-M. or '96 Mauser, firing at the

rate of over ten rounds per minute per man, will produce a very useful fire effect at 2,000 yards. He assumes that only seven shots can be fired under conditions which he thinks are easier, and he considers that only one round more per minute can be fired from the clip-loading Mauser or ten round-magazine L.-M. than from the needle-gun of 1866. He also in his lecture altogether ignores the use of smokeless powder.

He considers that "the greatest 'intensity' [of fire is] dependent on the discipline and drill of the troops." I should rather think that intensity of fire is directly proportionate to its accuracy, or, in other words, to the knowledge of musketry and practice of the combatants, provided the sighting is known. He further states: "During the course of a combat it is well known that the accuracy of fire falls off to an almost incredible degree." I can assure him that this is not the case with men who are *good* shots, and who consequently have confidence in their rifles. I fail to understand why writers on this subject, while recognising that the shooting of a soldier has been generally wild in action, have yet failed to recognise that on the other hand full knowledge of, and skill in the use of, his weapon, induces that coolness in action upon which accuracy of fire depends.

Lieut.-Colonel Maude speaks of "a body of men with modern weapons, firing as wildly as in Frederic the Great's time, sending their bullets 3,000 yards in distance and 2,000 feet in height" (? wide of the mark). I am unaware what system of musketry training was in vogue in Frederic the Great's time; but if errors to this extent are apt to occur with the present rifle, it shows that no use is made of the sights. The trajectory of a L.-M. bullet, fired with the 2,500 yards sight, is under 400 feet.

Again, he thinks: "If every man kept his muzzle horizontal [*sic*] when firing at fixed distances, it is obvious that nothing could possibly pass the zone of ground thus covered . . . . but the same tremor of the hand that sent the bullet wide with the old musket causes it to fly 1,000 yards clear of its object nowadays." This extraordinary statement, which banishes all thought of intensity of fire, he tell us, can be very aptly illustrated with a "garden watering hose."

We are also told that "about one-third of the Boers . . . possessed a skill with the rifle acquired after game . . . in which they were probably only equalled by the few British officers who have devoted the whole of their lives to big game shooting." I very much doubt whether shooting game with old-fashioned or express rifles up to a distance of, say 150 yards, has had much to do with the enemy's training for their 1896 model Mauser-shooting at 500 or 2,000 metres. Mauser rifles, we must remember, were only issued to the burghers shortly before the war. Their Sunday shooting at targets, which one still sees outside every little township, is a simple and intelligible explanation of how the enemy learnt to use their Mausers.

Lieut.-Colonel Maude is probably unaware that the L.-M. and Mauser rifles are undersighted—oversighted some people call it—at an altitude of from 4,900 to 5,000 feet, which is the height above sea-level of nearly all the field of operations of this war, to an extent of, roughly, 100 yards at 1,000 yards, and of 200 yards at 2,000 yards. This did not signify to the enemy, who used no range-finders, but judged distance (?) (of course erroneously) from where the sighting of their rifles carried the bullets.

We are reminded that "the losses of this campaign are the lowest ever recorded in warfare between two equally stubborn and well-armed antagonists." Because (throughout the lecture this fact is ignored) modern rifles determine battles without the combatants coming to close quarters. Yet, Lieut.-Colonel Maude is apt to confuse some people by stating that "at Meanee every musket on the ground killed 3 and wounded 6 in 3 hours." There is no means by which we can estimate the slaughter Sir

Charles Napier would have made if his scanty troops, firing at close quarters, had been armed with modern clip-loading rifles.

I am well aware that there are many other very much more capable writers than myself, who have learnt that it is because modern rifles with smokeless powder are so deadly at long ranges, that the tactics of earlier century battles and fighting have passed away never to return, as the fight is decided one way or the other before close quarters are reached. If close quarters are reached, one side has little more firing to do. Nevertheless, Lieut.-Colonel Maude states "increase of range in the infantry weapon . . . has . . . added to the advantage of the assailant . . . the argument in favour of training troops to fight . . . in close order has been enormously reinforced."

No writer on tactics, to my knowledge, has ever yet grasped the fact that the modern rifle requires a long course of training to do justice to its full fire effects. Even Mayne's "Fire Tactics" ignores "accuracy of fire." It is fallacious to estimate the power of the modern rifle from its use by indifferent shots, who have never been properly trained in its use. The latter, unfortunately, form the vast majority of the army out here.

A practical pamphlet, "Fighting of the Future," written by Major (now Lieut.-General Sir) Ian Hamilton in 1885, is worth more than much tactical teaching. His experience from the 1881 Transvaal War showed him the importance of good rifle shooting. I am convinced that 90 per cent. of British soldiers can become marksmen, if they are practically instructed and sufficient importance is attached to good shooting. Musketry, unlike tactical discourses, is a practical subject. It is, in my humble opinion, a mistake to formulate formations for infantry on the assumption that soldiers will always be bad shots, and unable to take advantage of the tremendous power and capabilities of their weapon.

Let us by all means hope that foreign nations will follow Lieut.-Colonel Maude's argument and continue to train their men to fight in close order. Meanwhile, let us ignore tactics for awhile, until British soldiers, in all parts of the world, have been practically and sufficiently instructed in the use of their rifles.

Orange River Colony,
April, 1902.

H. de B. HOVELL, Major,
2nd Bn. Worcestershire Regt.

NAVAL AND MILITARY CALENDAR.

SEPTEMBER, 1902.

1st (M.) 3rd Bn. North Staffordshire Regiment (Militia) / Half 3rd Bn. Argyll and Sutherland Highlanders (Militia) — Left Cape Town for England in the "Sunda."

3rd (W.) H.M.S. "Calypso" commissioned at Devonport as Naval Reserve Drill-ship in Newfoundland.

4th (Th.) Launch of first-class armoured cruiser "Donegal" from the Fairfield Yard, Govan-on-Clyde.

" " 3rd Bn. Northampton Regiment (Militia) left Cape Town for England in the "Scot."

5th (F.) The Boer Generals Botha, De Wet, and De la Rey had a Conference with the Colonial Secretary.

6th (Sat.) H.M.S. "Psyche" paid off at Devonport.

" " 5th Bn. Imperial Yeomanry
24th Bn. Imperial Yeomanry (241 men) } Arrived at Southampton from Cape Town in the "Plassy."

" " 4th Bn. East Surrey Regiment (Militia)
4th Bn. Yorkshire Regiment (Militia) } Left Cape Town for England in the "Tagus."

" " Lord Kitchener distributed war medals to the Montgomeryshire Imperial Yeomanry at Welshpool.

7th (S.) 6th Bn. Manchester Regiment (Militia) left Cape Town for England in the "Guelph."

8th (M.) 1st Bn. Sherwood Foresters (Derbyshire Regiment) left Cape Town for Hong-Kong in the "Wakool."

9th (T.) The German Imperial Military Manœuvres commenced.

" " 5th Bn. the Rifle Brigade (Militia)
3rd Bn. Leicestershire Regiment (Militia) } Left East London, South Africa, for England in the "Avondale Castle."

" " 31st Company Royal Garrison Artillery
7th and 45th Companies Royal Engineers
1st Bn. Suffolk Regiment
1st Bn. Border Regiment
2nd Bn. Hampshire Regiment } Left Cape Town for England in the "Canada."

" " 3rd Bn. Cheshire Regiment (Militia) left Cape Town for England in the "Harlech Castle."

10th (W.) The official report of the conference between the Colonial Secretary and the Boer generals was issued.

" " 6th and 11th Companies Royal Engineers
4th Field Troop Royal Engineers
5th Bn. Royal Warwickshire Regiment (Militia) } Left Cape Town for England in the "Briton."

" " 12th Brigade Division (43rd, 86th, and 87th Batteries) R.F.A. left Cape Town for England in the "Avoca."

11th (Th.) 38th Bn. Imperial Yeomanry arrived at Southampton from East London, South Africa, in the "Palawan."

" " 3rd Bn. Royal Sussex Regiment (Militia)
3rd Bn. Wiltshire Regiment (Militia) } Arrived at Southampton from Cape Town in the "Dominion."

" " 4th Bn. Durham Light Infantry (Militia) left Cape Town for England in the "Roslin Castle."

12th F.) U Battery R.H.A.
37th Battery R.F.A.
3rd Bn. Lincolnshire Regiment (Militia)
3rd Bn. Essex Regiment (Militia)
4th Bn. Royal Dublin Fusiliers (Militia) } Left Cape Town for England and Ireland in the "Cestrian."

13th (Sat.) The British Rifle Team won the Palma Rifle Trophy at Ottawa, Canada.

" " 3rd Bn. Liverpool Regiment (Militia)
4th Bn. Liverpool Regiment (Militia) } Arrived at Southampton from Cape Town in the "Walmer Castle."

13th (Sat.) 3rd Bn. Grenadier Guards, 1st Bn. West Riding Regiment, 1st Bn. Yorkshire Regiment } Left Cape Town for England in the "Lake Michigan."

" " 1st Bn. Coldstream Guards, 1st Bn. Scots Guards, 1st Bn. Oxfordshire Light Infantry } Left Cape Town for England in the "Winfredian."

15th (M.) 2nd Bn. Coldstream Guards left Port Elizabeth for England in the "Mohawk."

16th (T.) H.M.S. "Terrible" arrived at Plymouth.

" " H.M.S. "Hawke" arrived at Chatham with relieved crews from Mediterranean.

" " 3rd Bn. East Yorkshire Regiment (Militia), 6th Bn. Worcestershire Regiment (Militia) } Left Cape Town for England in the "Greek."

17th (W.) Martial Law was repealed in Cape Colony, and the Peace Preservation Act proclaimed.

" " 5th Bn. Middlesex Regiment (Militia) arrived at Southampton from Cape Town in the "Assaye."

" " 2nd Brigade Division R.F.A., 2nd Bn. Grenadier Guards, 2nd Bn. North Staffordshire Regiment } Left Cape Town for England in the "Galeka."

" " 1st Bn. Loyal North Lancashire Regiment left Cape Town for England in the "Carisbrook Castle."

18th (Th.) H.M.S. "Isis" commissioned at Chatham as tender to "Britannia."

" " 61st and 65th Batteries R.F.A., 3rd Field Troop and 29th Company Royal Engineers } Left Cape Town for England in the "Sicilia."

" " "C" Pontoon Troop and 31st Company Royal Engineers, 1st Bn. Cameron Highlanders } Left Cape Town for England in the "Dunera."

19th (F.) 3rd Bn. Highland Light Infantry (Militia) arrived at Southampton from Cape Town in the "Doune Castle."

20th (Sat.) Launch of first-class cruiser "Berwick" from the Beardmore Works, Govan-on-Clyde.

" " 3rd Bn. Northampton Regiment (Militia) arrived at Southampton from Cape Town in the "Scot."

" " 5th Bn. Royal Garrison Regiment left Southampton for Halifax, Nova Scotia, in the "Aurania."

22nd (M.) 3rd Bn. York and Lancaster Regiment (Militia), Half 3rd Bn. Argyll and Sutherland Highlanders (Militia) } Arrived at Southampton from Cape Town in the "Oswestry Grange."

" " 3rd Bn. North Staffordshire Regiment (Militia), Half 3rd Bn. Argyll and Sutherland Highlanders (Militia) } Arrived at Southampton from Cape Town in the "Sunda."

23rd (T.) H.R.H. Field-Marshal the Duke of Connaught presented their first colours to the 4th Bn. Royal Warwickshire Regiment in Dublin.

24th (W.) 4th Bn. East Surrey Regiment (Militia), 4th Bn. Yorkshire Regiment (Militia) } Arrived at Southampton from Cape Town in the "Tagus."

24th (W.) 27th and 31st Bns. Imperial Yeomanry left Cape Town for England in the "Manchester Merchant."

" " 2nd Bn. Essex Regiment
1st Bn. Royal Irish Fusiliers
1st Division Telegraph Bn. R.E. — Left Cape Town for England in the "Pinemore."

" " 10th Hussars
12th Lancers
1st Bn. Royal Munster Fusiliers — Left Cape Town for India in the "Lake Manitoba."

" " 63rd, 92nd, and 99th Companies R.G.A.
1st Bn. King's Royal Rifles — Left Cape Town for Gibraltar and Malta in the "Sardinia."

25th (Th.) 1st Royal Dragoons left Cape Town for England in the "Kildonan Castle."

26th (F.) 31st Company R.G.A.
7th and 45th Companies Royal Engineers
1st Bn. Suffolk Regiment
1st Bn. Border Regiment
2nd Bn. Hampshire Regiment — Arrived at Southampton from Cape Town in the "Canada."

" " 5th Royal Irish Lancers
13th Hussars — Left Cape Town for England in the "City of Vienna."

" " 2nd Bn. Rifle Brigade left Point Natal for Egypt in the "Malta."

27th (Sat.) 6th and 11th Companies Royal Engineers
4th Field Troop Royal Engineers
5th Bn. Royal Warwickshire Regiment (Militia) — Arrived at Southampton from Cape Town in the "Briton."

" " 2nd Bn. Scots Guards
1st Bn. Black Watch
2nd Bn. Manchester Regiment — Left Point Natal for England in the "Michigan."

28th (S.) 5th Bn. Royal Garrison Regiment arrived at Halifax, Nova Scotia, from England in the "Aurania."

" " 17th Lancers
2nd Bn. Dorsetshire Regiment — Left Cape Town for England in the "German."

29th (M.) It was officially announced that a second, or King's medal, would be issued for the recent South African campaign to all who had completed 18 months' service by 1st January or 1st June, 1902.

" " 6th Bn. Manchester Regiment (Militia) arrived at Southampton from Cape Town in the "Guelph."

" " 5th and 39th Batts. R.F.A.
"A" Pontoon Troop and 17th Company Royal Engineers
18th Hussars
1st Bn. Leinster Regt. (Royal Canadians) — Left Cape Town for England in the "Englishman."

30th (T.) 9th and 17th Batts. R.F.A.
2nd Bn. Royal Fusiliers
1st Bn. Gordon Highlanders — Left Cape Town for England in the "Salamis."

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletin del Centro Naval.* Buenos Aires: July, 1902.—"Bilge Keels" (*concluded*). "The Machinery of a War-ship in War-time" (*continued*). "Minute by the Minister of Marine" (*continued*). "Experiments with Coast Electric Search-lights." "Naval Intelligence." "The Gunner's Manual" (*continued*). "Foreign Naval Notes."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. X. Pola: October, 1902.—"Electric Fittings on board Ship." "French Naval *Points d'Appui.*" "The Second 'Belleisle' Experiments." "The Duties of the Scouting Service." "Foreign Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: August, 1902.—"A New Gun: the Quebra-Mar." "Extract from the Report Presented to the Chief of the General Staff by the Commander of the Torpedo-boat Division" (*continued*). "On Light-houses" (*continued*). "The Coast Navigation between Bahia and Rio de Janeiro" (*continued*). "The Electrical Installation of the Battle-ships 'Deodora' and 'Floriano.'" "Against Submarines." "The Naval Training Ship 'Benjamin Constant.'" "Foreign Naval Notes."

FRANCE.—*Revue Maritime.* Paris: September, 1902.—"The German Navy League and the German Fleet in 1902." "Methodical Stoking." "Combinator for Regulating the Turns for Cleaning the Furnaces in Naval Boilers." "Foreign Naval Notes."

Le Yacht. Paris: 6th September, 1902.—"Blockades." "The Sardine Fishery at Biarritz." "Foreign Navies." 13th September.—"The English Submarines." "Submersibles and Submarines." "New Regulation for the Mercantile Marine." "The Mercantile Marine: French and Foreign." 20th September.—"The Tension of Trajectories and the Torpedo-Avisos Fitted with High-Angle-Fire Guns." "The Foreign Element in English and United States Merchant-Ships." "Foreign Navies." 27th September.—"Our Squadrons in 1902: Modification of the Effectives." "The Cruise of the Minister of Marine in Corsica and Tunis." "The Mercantile Marine: French and Foreign."

Le Moniteur de la Flotte. Paris: 6th September, 1902.—"Reductions in the Effectives." "Foreign Fleets." 13th September.—"About the Persian Gulf." "M. Pelletan at Corsica and Tunis." "Foreign Fleets." "The Hayti Incident." 20th September.—"The Utilisation of the *Défenses-Mobiles.*" "M. Pelletan at Corsica and Tunis." "Foreign Fleets." "Wireless Telegraphy." 27th September.—"The Improvement of the Inland Water-ways." "M. Pelletan at Corsica and Tunis." "Foreign Navies."

La Marine Française. Paris: 15th September, 1902.—"The Navy and the Finances." "The Crisis in the Personnel and the Practical Fusion of the Executive and Engineer Officers of the Fleet." "History of the Gibraltar Question since the English Occupation up to the Present Time." "The Mercantile Marine." "White and Yellow in China." "Foreign Naval Notes."

GERMANY. — *Marine-Rundschau.* Berlin : October, 1902. — "Laird Clowes' 'History of the Royal Navy,' Vol. VI." "The French Naval Manœuvres of 1902." "The Question of the Giving Up of Deserters, in particular of Men-of-Wars' Men." "The Cruise of H.I.M.S. 'Falke' up the Amazon." "The Tactical Manœuvres of the English Fleet in the Channel, 1902." "The Second 'Belleisle' Experiments." "Points of View for the Construction of Tables for Use in Teaching Practical Navigation." "Foreign Naval Notes."

ITALY.—*Rivista Marittima.* Rome : October, 1902.—Has not been received.

PORTUGAL.—*Revista Portugueza. Colonial e Maritima.* Lisbon : August, 1902.—"Intercourse between Flanders and Portugal from 1094 to 1682" (*continued*). "Portuguese Congo" (*continued*). "Talent de bien faire." "Penal Transportation and Colonisation" (*continued*). "Foreign Naval Notes."

September, 1902.—"Intercourse between Flanders and Portugal from 1094 to 1682" (*continued*). "Portuguese Congo" (*continued*). "Penal Transportation and Colonisation" (*continued*). "The Colonial Movement." "Foreign Naval Notes."

SPAIN.—*Rerista General de Marina.* Madrid : October, 1902.—"The Armoured Cruiser 'Cardinal Zimenez de Cisneros.'" "History of an Unused Dockyard, Channels which are Silting up and a Bay which is Disappearing." "The Review at Spithead." "Torpedo Exercises." "The Casemates for the 14-centimetre Guns mounted on board the Armoured Cruiser 'Cardinal Cisneros.'" "Complaints from Ships in the various Atlantic and Pacific Ports, and the Monetary Systems of some of the Spanish-American Republics." "The French Naval Manœuvres of 1902." "Foreign Naval Notes."

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna : 6th September, 1902.—"Manœuvre Impressions." "The Naval Manœuvres in the Adriatic." "Decrease in the United States Standing Army." 14th September.—"Imperial Manœuvres in Western Hungary." "The Naval Manœuvres in the Adriatic" (*concluded*). 22nd September.—"Go-as-you-please Manœuvres." "Imperial Manœuvres in Western Hungary." "Education of Young Officers in England." 30th September.—"Suspension of Hostilities." "His Majesty's Battle-ship 'Babenberg.'" "Promotion of Officers in the Italian Army."

Organ der Militär-wissenschaftlichen Vereine. Vienna : Vol. LXV., Part 2, 1902.—"A French Criticism on the Prussian Leadership before the Commencement of the Crisis on the 3rd July, 1866." "Partisan Warfare and Battle Tactics in the time of Maria Theresa." "The Latest Position of Wireless Telegraphy and the Telephone."

Vol. LXV., Part 3.—"The French Army in Germany on the Outbreak of the War of 1809." "Lord Roberts' Infantry Drill Regulation for 1902, in Comparison with similar Regulations in Germany, Italy, France, Austria-Hungary, and Russia."

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NOTICES OF BOOKS.

Studien zur Kriegsgeschichte und Taktik 1870-71. Herausgegeben vom Grossen Generalstab. Kriegsgeschichtliche Abtheilung I. Berlin: Mittler und Sohn. Kochstrasse, No. 71. 1901.

The book before us is the first volume of a series of studies intended to supplement and correct the original history of the war of 1870, published by the General Staff immediately after the events.

The original work was based almost entirely on reports and returns in the possession of the Staff, these being the only documentary evidence available. Since that period an enormous quantity of material, official and otherwise, dealing with the French side of the question has made its appearance, which enables a better and truer conception of the actual conditions of the opposing forces at different moments to be arrived at, and clears up many of the apparent contradictions and difficulties which formerly confronted the conscientious student.

This first volume deals with (1) the movements of the IInd Army and of the French Rhine Army on the 16th and 17th August, 1870; (2) the operations of the IIIrd and Meuse Army from 23rd to 29th August; (3) the retreat of General Chanzy from Orleans to Vendôme; and (4) the operations in the south-east of France, including the formation of the Ist Army of the Loire at Bourges, the railway transport from Bourges towards Besançon, and the subsequent operations to the surrender of Pontarlier.

The chief interest of all these papers lies in the pictures they reveal of the condition of affairs in rear of the respective armies and the sidelights they incidentally cast on the practical working of the "requisition system," particularly in a rich and fairly populated country. Both nations, it is well known, relied on requisitions to eke out their regular supply trains, but the subject is one which does not admit of precise formulation in peace-time: you cannot prescribe exactly how much a unit may take under all conceivable circumstances, and such orders could not be enforced even if they could be written—above all, you cannot practise requisitions even at autumn manœuvres, hence both armies approached the subject from the standpoint of Napoleonic tradition, and the results were curious, not to say startling.

It comes to this: that had not the deficiencies in the French regular supply and transport departments compelled the Rhine Army to form makeshift trains out of

wagons and cattle hired in the districts where they detrained, it is quite possible that the Germans would have been compelled to halt for some days at most critical periods, not for want of trains, but because they would have had too many. This came about in the following very simple manner:—Each commander, anxious to render himself as independent of supply from the rear as possible, requisitioned enough to enable him to see his way clear for four or five days in advance, and the next junior arrival, unaware of the solicitude of his senior predecessor, thought it also well to be on the safe side and took the balance of what the place provided. So it went on at each succeeding halting places, till every wheeled vehicle and four-legged animal was endeavouring to keep up with the German Army. As long as they were moving on a broad front, the result was not very apparent, but when the enemy's resistance suddenly developed and they were compelled to concentrate, blocks and friction of every imaginable kind began to develop, and matters reached a crisis on the nights of 16th, 17th, and 18th August, when parts of the trains of the IIIrd, IXth, VIIth, and VIIIth Corps all got jammed in the defiles below Gorze.

On the French side matters were no better, for over and above the improvised trains requisitioned by corps commanders, every unit had picked up a few additional carts, and when the rearward movement after the battle of Vionville took place, the returning stream of carts met the ascending one in the ravines leading up to the St. Privat plateau, and all soon got mixed in inextricable confusion.

Things were not much better when MacMahon's movement to the relief of Metz entailed the great wheel to the right of the IIIrd and Meuse Armies. The roads through the mountains and forests were difficult in even fine weather, and quite unfitted for the load suddenly put upon them in an exceptionally rainy season. They appear also to have been only indifferently known by the Staff, and crossings on the march of trains and columns were by no means infrequent. Fortunately, the men's spirits had been raised by victory, and they struggled along, reaching their appointed positions late certainly, but in time to resume the march next morning. It is this side of the war which it has always been so essential for us to get at, if we were to do justice to the fighting qualities of the Germans. Seen through the Prussian official, things all seemed to go too smoothly and easily: the human nature element was absent, and one lost sight of the inherent difficulties of wheeling a quarter of a million men about. Reading of the staff duties of small bodies, brigades, and divisions, it all seems so very simple, and the insistence on minor points so pedantic; it is only when we get these vivid-speaking pictures of armies moving on a narrow front that one realises the consequences of the "cumulative error" as it spreads and propagates.

The railway transport of the Loire Army from Bourges to Besançon is another admirable study of this same "cumulative error" arising. It does not appear that any one man did any one thing which, from his standpoint, was not reasonable and justifiable, but the gross result was almost catastrophic. It would have been wiser and better in every respect, even in the bitter weather which prevailed, to have marched the army the whole way. They would at least have improved in discipline on the road. But as it was, cooped up in crowded trains, blocked for hours together, even days, discipline and patriotism alike evaporated, and the army was a more worthless mob when it reached its destination than when it started.

The one thing that comes best out of the whole series of studies is the conduct and devotion of the French general officers after Sedan. Chanzy's retreat from Orleans to Vendôme, under all the circumstances of bad weather, raw troops, and so forth, was masterly—far superior to the "change of position right back," of the Rhine Army on 17th August. With a victorious enemy in his front he fell back day by

day in deployed lines, ready for action at any moment, and never gave a single opening.

Even Bourbaki is shown to have deserved well of his country; he at least did all that was, humanly speaking, possible under the conditions of civilian interference from above and insubordination from below, with which he had to contend. One is tempted to ask, How would a higher general level of education have improved matters? and the answer is difficult to find, at least in a form which would satisfy a Parliamentary committee with a good cross-examining list of members. It does not appear that anywhere, or on either side, there was any want of intelligence—on the contrary, nine-tenths of the difficulties seem to have arisen from excess of that quality which would have been curbed by more extended experience. But how are we to get this experience? In civilised countries we could not exact the sacrifices war entails from men and officers worse paid than any civilian employés of private firms; and if we did, and men stood it, there is still the outcry of their civilian relations, through their Parliamentary representatives, that no Government in any European State, except Russia, can afford to ignore. The conclusion is, that these and similar troubles are necessary and inseparable conditions of our present state of civilisation, which can only be minimised by some form of popular government and education which will imbue every individual with the conviction that the ideal his nation stands for is worth his individual while to fight and die for—an ideal no nation has yet attained to in a higher degree than our own; and when the civilian critic points the finger of scorn at our recent efforts in South Africa, we would ask him to study the evidence in the work now before us and ask himself how Germans and French would have fared in a theatre of operations 7,000 miles away, practically unmapped, unexplored, and inhabited by natives whose language not one man in a thousand has ever succeeded in mastering.

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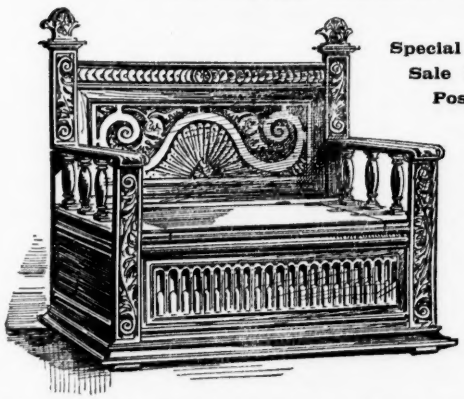

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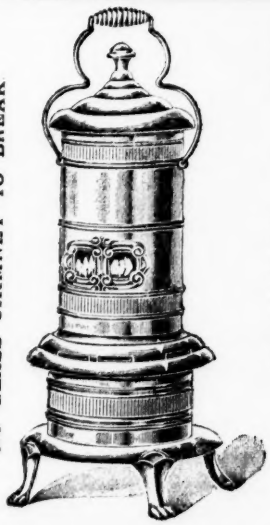

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